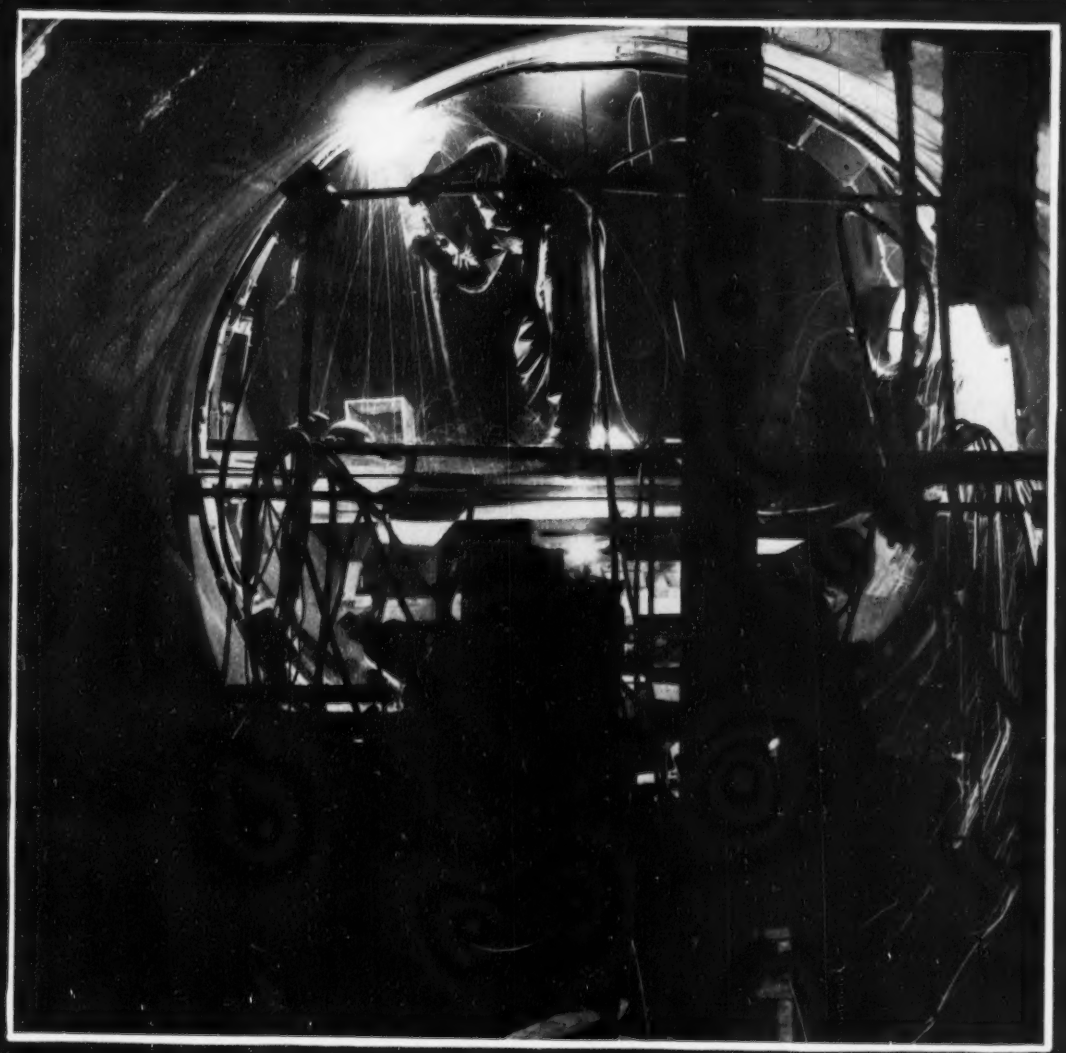
ENGINEERING NEWS-RECORD



★ Rolling formwork solves speed problem (p. 33)

★ Prestressed tile for all-tile building (p. 39)

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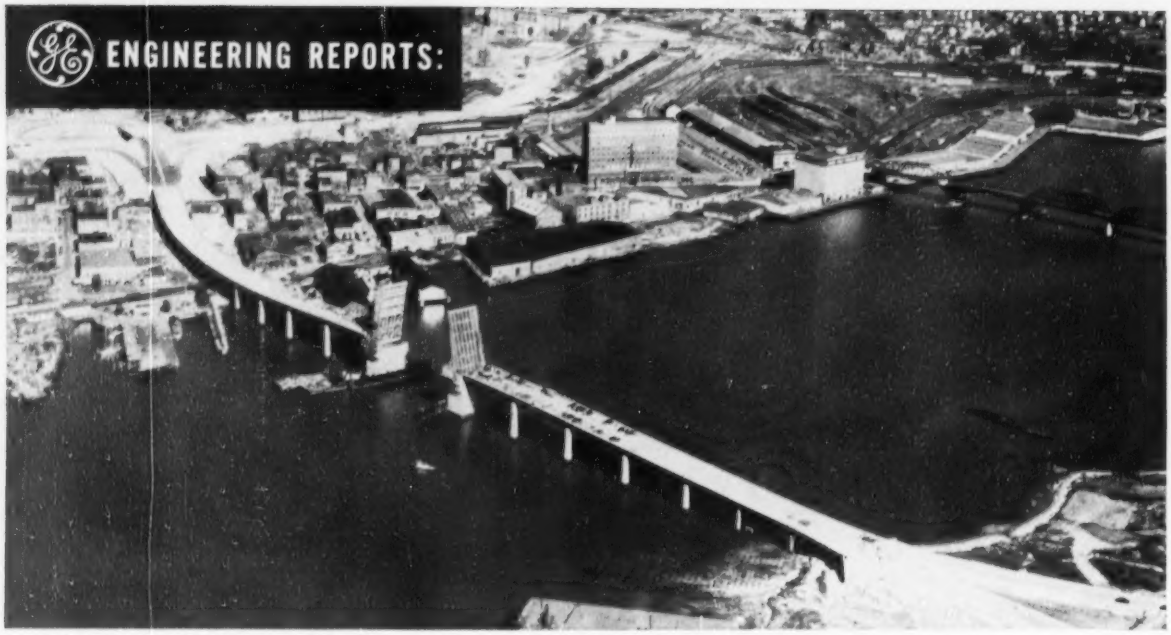


MOTORISTS SAVE 10 TO 30 MINUTES crossing from Norfolk to Portsmouth via the new G-E equipped bridge and tunnel. Bridge is 4-lane, 2135 ft between abutments. Bascule span is of the double-leaf, rolling-lift type with leaves each 90 ft long.

Bridge's drive system helps speed 29,000 cars per day

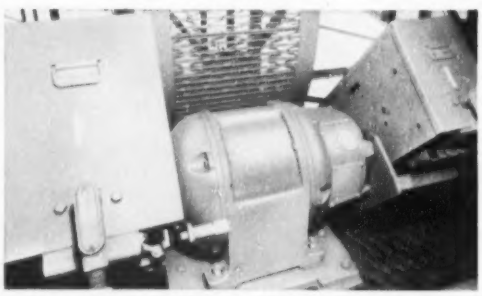
G-E equipment at Portsmouth - Norfolk Bridge gives fast movement, positive control of leaves

The new 4-lane bascule bridge across the Elizabeth River at Norfolk, Va.—part of a combined bridge and tunnel project built for the Portsmouth–Norfolk Bridge Tunnel Commission — is currently handling over 29,000 vehicles per day. Ability to handle this heavy traffic flow is due in part to electric equipment supplied and co-ordinated by General Electric.

In helping to develop the bridge's drive system, G-E engineers worked closely with J. E. Greiner Co., consulting engineers, Tidewater Construction Corp., engineers and contractors, and Tuck and Kendall Inc., electrical contractor. Result of this co-operation: a simple, dependable drive system that expedites traffic because it is easy to operate and provides positive-action control of bridge leaves for fast movement and smooth, safe seating.

This is one more example of how G-E engineers can help your engineers or consultants on electric equipment for heavy construction projects. For other examples of how G-E application engineering has been utilized on many of the important bridge "firsts" throughout the country, contact your local G-E Apparatus Sales Representative or write for a copy of GED-1982. General Electric Co., Schenectady 5, New York. 664-26

POSITIVE-ACTION CONTROL of span motors is centered in this G-E operator's desk. Fine-scale selsyn dial pinpoints position of each leaf during seating.



EACH LEAF IS MOVED by 2 G-E 25-hp motors (one shown). G-E motor control center, operated from desk, controls these and tail locks, gates, barriers.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

View of completed end span over railroad tracks. Blast plates, barely visible beneath the girders, are ½-in. Mayari R plates. Bridge was fabricated and erected by Bethlehem.

New bridge has 153 ft Mayari R span to protect against locomotive exhaust

This new four-lane highway bridge at Connellsville, Pa., is an 800-ft cantilevered-deck-girder structure. It carries Route 117 across the Youghiogheny River and six tracks of a railroad that still runs plenty of steam power over the line. Though the bridge is but a few months old, the paint on the northernmost span already shows the discoloring evidence of corrosive exhaust fumes.

To protect the bridge against corrosion from this source, the designers chose Mayari R low-alloy, high-strength steel for the 153-ft span over the tracks. All main material was fabricated from Mayari R, as was all detail material except sole and masonry plates, and the expansion dam at the hinge.

Looking south during construction of highway bridge at Connellsville, Pa., with Mayari R span in foreground.

Mayari R is the logical choice for construction which must face severely corrosive atmospheres. Tests over a 17-year period show that Mayari R has 5 to 6 times the atmospheric-corrosion resistance of plain carbon steel, and 2 to 4 times that of copper-bearing steel. On Mayari R, the scale forms in a closer-grained, tighter coating which sharply retards further corrosion in the metal beneath.

Mayari R has other advantages, too: better abrasion-resistance, higher yield point and greater tensile strength than carbon steel. It can be formed, machined and welded with ordinary equipment and methods. For further details, call or write us for the new Mayari R Catalog 353.

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

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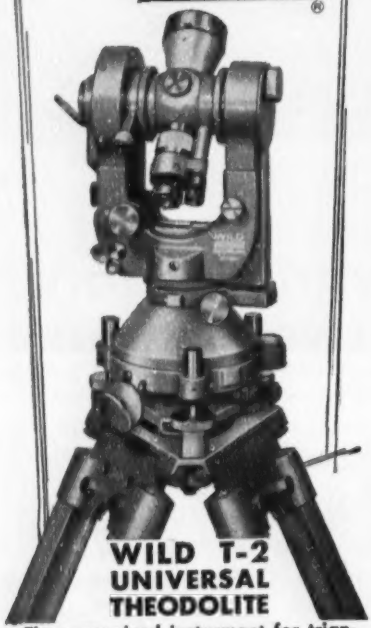

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Contents on page 17

Waldo G. Bowman

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Robert F. Boger

Publisher

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READER COMMENT

Add to list

SIR: We would inform you that the Owen Falls Hydro Electric Scheme in Uganda (ENR March 4, 1954, p. 50) is being constructed by the Owen Falls Construction Co., an independent company formed by the following firms, and whose Chairman is Olaf Kier.

Christiani & Nielsen Ltd.
Dorman Long & Co. Ltd.
Edmund Nuttall Sons & Co. (London) Ltd.
N. V. Hollandsche Beton Mij.
N. V. Intern. Gew. Beton Bouw.
J. L. Kier & Co. (London) Ltd.
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N. V. Nederl. Beton Mij. Bato.

There is no question of any individual firm having any separate identity in the construction of this scheme.

J. R. DAYTON
Commercial Manager
J. L. Kier & Co. Ltd.
London

Fixity can't be controlled

SIR: In the article, "Welding a tall building," by Alfred Oboler (ENR Feb. 11, p. 38) there is a statement on partial fixity: "The top plate undergoes a small inelastic deformation under excessive end moment, allowing the beam end to rotate." The idea is excellent—to attempt to obtain equal negative and positive moments in a given beam, for economy. It works fine for cantilever roof purlins with a relatively free hinge (bolted splice) at a point about 0.145 times the span length from supports. However, I do not believe any designer can determine or control "inelastic deformation" to get the desired 75% end fixity (for moment of $WL/16$), without the possibility of progressive and complete plate rupture, resulting in a moment of $WL/8$ and a stress of 40,000 psi, at the center of the span.

Assuming 20-ft column spacing and uniform loading on the beam causing a stress of 20,000 psi, the top flange of a simple beam will move about 0.11 in. inward horizontally, as determined by area moments. If an attempt is made to develop negative moment by adding a top end plate of an area not less than the beam flange, to provide for the necessary elastic elongation of about 0.0275 in. with 75% and fixity, there would have to be an unwelded length of plate of about 6 times the plate width between the column butt weld and the fillet weld attaching the plate to the beam.

The actual result of this assumed "inelastic deformation" appears to be about 95% of full and fixity, with the flange plate unwelded length of 1.2 times the plate width. This assumes, of course, that the stiffness of the column and the other beam at this joint would resist the 95% of $WL/12$, the fixed-end moment, and would be so designed.

The effect on the fully loaded beam designed for $WL/16$ will be an increase in the fiber stress from 20,000 psi to about 25,000 psi under the same uniform loading.

Probably, a more acceptable line of reasoning would be to consider the joint 100% fixed with a 20% increase in allowable stress (considering the unsupported compression flange), in accordance with AISC specifications.

In summary, I do not believe that either a weld or structural steel is a ductile material in the usual sense. If steel or the welds are in tension, the connection must be made sufficiently strong to take care of the forces in accordance with the usual theory of elasticity.

W. MCK. GREEN, C. E.
Structural Engineer
Greenville, S. C.

Connections perform well

SIR: A reference to common practice, as well as research on welded building connections should clarify the points raised for discussion by W. McK. Green in his letter discussing the article, "Welding a tall building," (ENR Feb. 11, p. 38). Mr. Green questions the possibility of determining and controlling nonelastic (plastic) deformation in a welded top-plate beam connection, to assure a desired degree of end-fixity, without the possibility of progressive deformation and complete rupture of the top connection plate.

Tests of semi-rigid connections have been made at Lehigh University in a program of the Structural Steel Committee of the Welding Research Council ("Tests of Welded Top-Plate-and-Seat Building Connections," by J. L. Brandes and R. M. Mains, THE WELDING JOURNAL, vol. 23, No. 3, Mar., 1944, pp 146-S to 165-S). Relationships between moment and end-rotation that were developed by the tests provide data that can be used by a designer to proportion such semi-rigid connections, provided sizes of

(Continued on page 8)

B.F.Goodrich

announces a new All-Purpose tire

Built upside-down to resist bruises—wears longer

THE upside-down All-Purpose construction guards against bruises that often start with the inside ply. Look at the cross section of the new B. F. Goodrich All-Purpose truck tire below. The patented BFG nylon shock shield (1) under the tread protects the All-Purpose body from smashing road shocks.

The breakers (2) between the *bottom* plies are a unique All-Purpose feature. An ordinary tire is built with all the breakers on *top* of the plies, where heat is most likely to develop. Breakers in the All-Purpose form an extra shock shield, add no bulk under the tread, instead add bonus miles of service and give more recappable tires.

B. F. Goodrich has built the All-Purpose tread as much as 67% *deeper* than that of a regular tire! Yet the All-Purpose costs only a little more. The center rib widens as the tread wears. More and more rubber contacts the road, decreasing the rate of wear.

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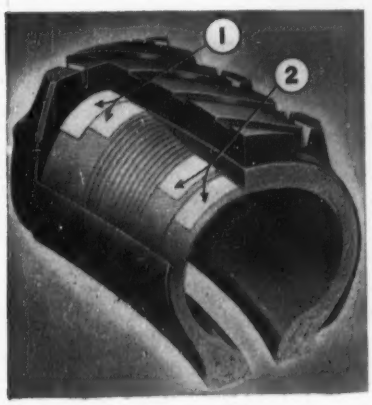

ALL-PURPOSE TIRES begin the trip from coal tipple to customer over rugged mine roads as well as paved highways. The All-Purpose tread is compressed to resist abrasion in this tire-killing work.

Specify B. F. Goodrich tires when ordering new trucks

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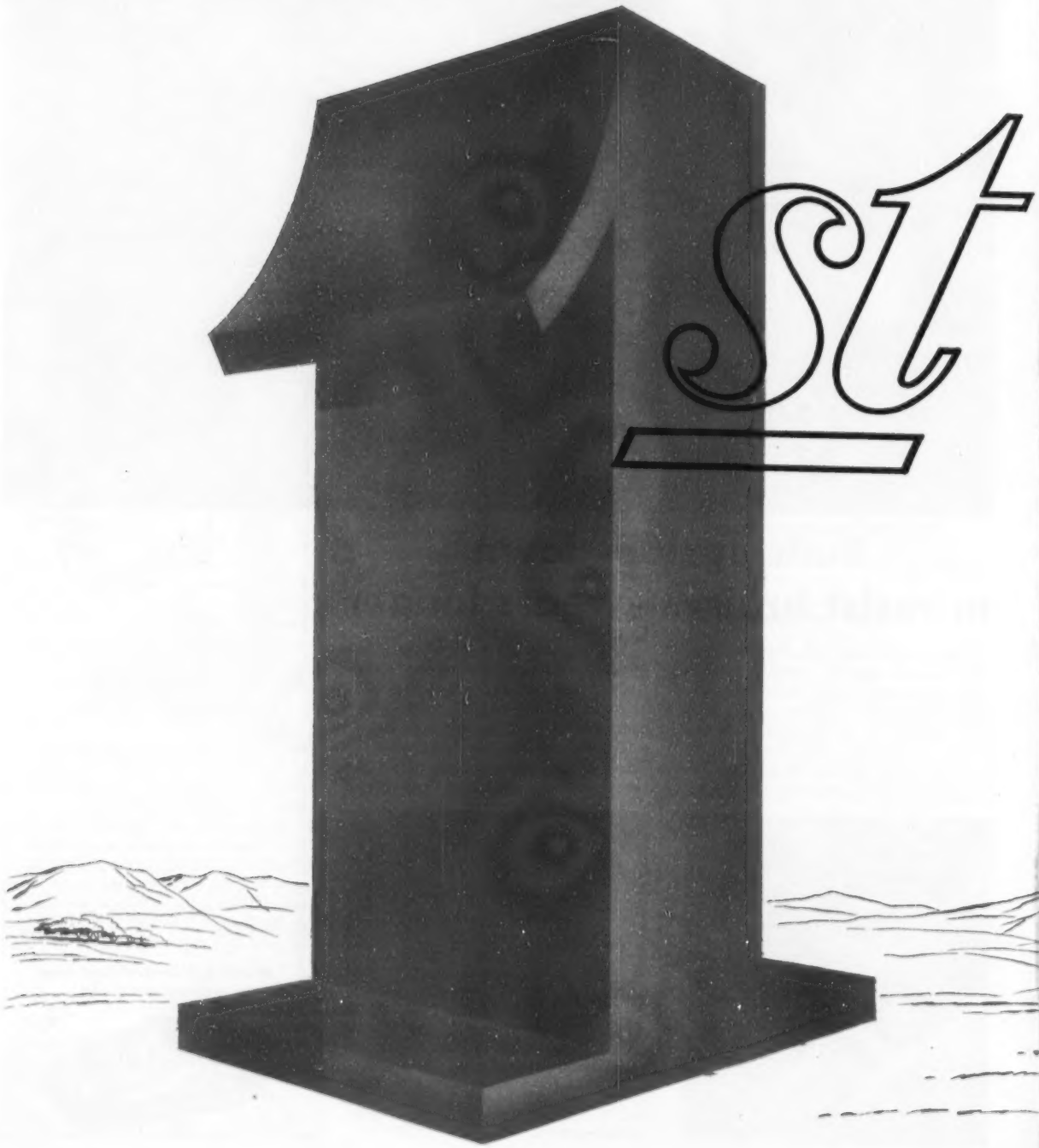

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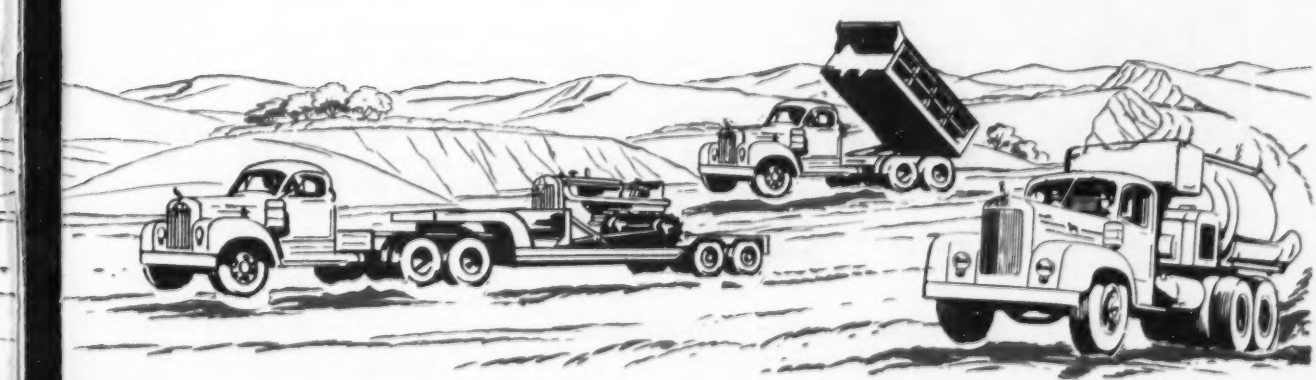

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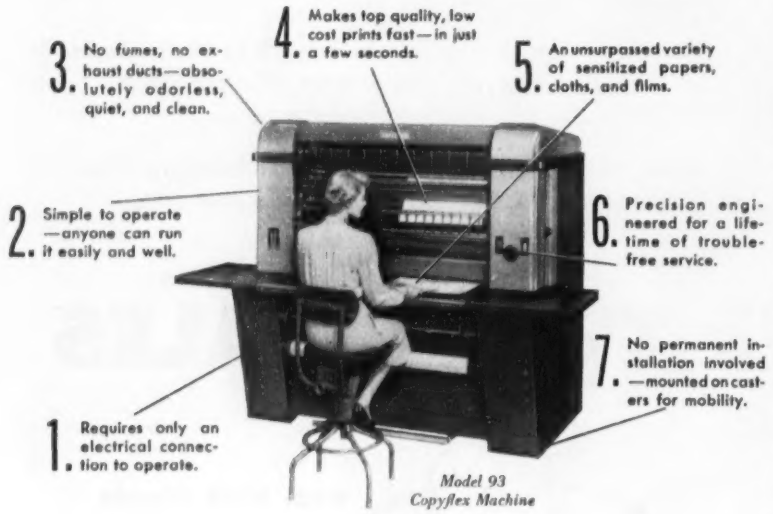
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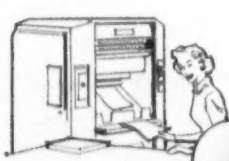

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READER COMMENT

beams and connections do not depart too far from those of the tested connections. The semi-rigid top-plate connections used by Mr. Oboler in the Miami Beach building appear to be of the same type as those tested.

An extension of the Lehigh University program has been proposed to widen its scope. This would be desirable. However, in the meantime, some assurance may be derived from the fact that welded top-plate connections of the same type have been used in practice for quite a number of years and for quite a range of beam sizes. No indications of distress have been reported.

Furthermore, it is a well recognized fact that the proportions used for many years in riveted wind-bracing connections and in end connections for deep girders and trusses, are such that a considerable amount of plastic deformation necessarily must have occurred, even though the designer assumed simple support with no restraint. Despite these inaccuracies in design and the resulting moments induced in supporting columns, the frames have behaved in a satisfactory manner, although a more rational approach to design is certainly desirable, as compared with that used by some designers.

In connection with the reference to the AISC specifications, made by Mr. Green, attention should be drawn to the fact that in "Type II" construction, provisions are made for the use of semi-rigid connections.

With reference to the expression "inelastic deformation" which is placed in quotes by Mr. Green, the writer must assume the responsibility for this unfortunate choice of words, because it was taken from his "Manual of Design for Arc Welded Steel Structures" (Air Reduction, New York, N. Y.). A more proper expression would be "nonelastic deformation."

LaMotte Grover
Welding Engineer
Air Reduction Sales Co.
New York, N. Y.

On low-flow control

Sir: In ENR of Feb. 18, pp. 102-105 you give the story on what low-flow control has done for several rivers.

The Miami River watershed has been working on a controlled river flow for several years. In 1953 we succeeded in convincing the Miami Conservancy Court that a sub-district of the Miami Conservancy District should be formed to control the river

(*Continued on page 10*)

Shaves time from every working cycle

Loads *faster!*

Travels *faster!*

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Le Roi Transo TLF-150 Front-end Loader

YOU move more material—faster—at lower cost — with this Le Roi Transo 1½-yard Front-End Loader. It saves you money every minute it's working — and here's why:

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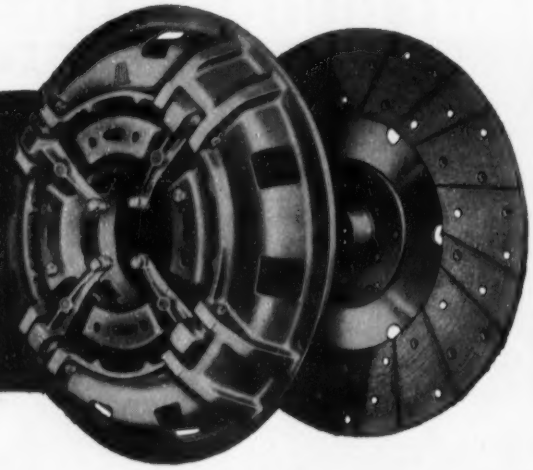

Just as long as there's the least bit of wearing surface left on the friction material, the Lipe Constant-Capacity Clutch maintains its torque capacity. A unique application of the toggle principle automatically compensates for friction material wear. The constantly increasing leverage of the toggle —which never goes over center—builds up pressure in almost direct ratio to friction material losses and compensates for fading pressure of expanding springs.

DESIGNED FOR HEAVY DUTY, LONG-WEARING SERVICE

PARALLEL CONTACT—because arrangement of the toggles assures a uniform pressure application pattern. Every square inch of facing area engages simultaneously, preventing highly concentrated heat areas and spot burning.

LIPE Constant-Capacity CLUTCH

- Engages firmly and smoothly
- Automatically compensates for wear of friction material
- Automatically compensates for fading pressure due to spring expansion and fatigue
- Balanced spring pressure through toggles maintains parallelism of pressure plate
- High thermal efficiency dissipates heat rapidly
- Internal cooling protects springs from overheating and loss of temper
- Automatically compensated pressure needs no adjustment

NO SERVICING—because these self-compensating, non-adjustable clutches insure automatic internal adjustment throughout the life of the clutch facings.

SOFT ENGAGEMENT—because the toggles absorb the initial energy of the springs... and because the speed of the toggle action fades as the pressure plate approaches the friction element.

HIGH THERMAL EFFICIENCY—because the massive plate, ribbed for rapid radiation, is cooled by generated air currents.

Write for specifications, performance data, and free service manual.

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Lipe-ROLLWAY CORPORATION

Manufacturers of Automotive Clutches and Machine Tools

Syracuse 1, N. Y.

READER COMMENT

for purposes as follows:

(a) Increase the self-purification capacity of the river and thereby help to correct pollution.

(b) Recharge the underground water in the area and thereby prevent or reduce the downward trend in the ground water level.

(c) Increase the river water supply available to industrial and domestic users.

The court approved the formation of the district with the understanding that interested parties were to raise $200,000 for the engineering project. We have at the present time raised more than $170,000, and the project is soon to be launched.

The Miami valley formed and planned its own flood prevention, and it is paid for. It is now about to launch a comprehensive study of increased river flow for beneficial purposes. Included in this study will be recharge of the aquifer.

O. B. REEMELIN, *Chairman*
Miami Valley Water Conservation Committee
Dayton Chamber of Commerce

Fly-ash evaluation

SIR: The article on the use of fly-ash as a replacement for portland cement in fly-ash concrete (ENR March 25, 1954, p. 22) emphasizes the need for some method of evaluating the expected performance of a particular fly-ash in the finished concrete.

Many fly-ashes are highly pozzolanic; they are not cements by themselves but have the ability to combine with the free lime of the cement to form cementitious compounds. However, because fly-ashes are produced from many different varieties of coal, which are burned in various ways, their physical and chemical properties vary widely. As might be expected, their performance in finished concrete also varies, and the only reliable method at present of predicting a property such as compressive strength is to run tests on samples of the finished product.

During the spring and summer of 1952, I attempted to compare the compressive strength and shrinkage of portland-cement-fly-ash concrete with the chemical constituents of the fly-ash. Because the compressive strength of the fly-ash concrete mentioned in the ENR article was compared with the compressive strength of straight portland-cement concrete, the following data taken from our tests at Kansas State College may be of interest:

Twelve different fly-ashes were used in the test mixes with both Type I and

(*Continued on page 12*)

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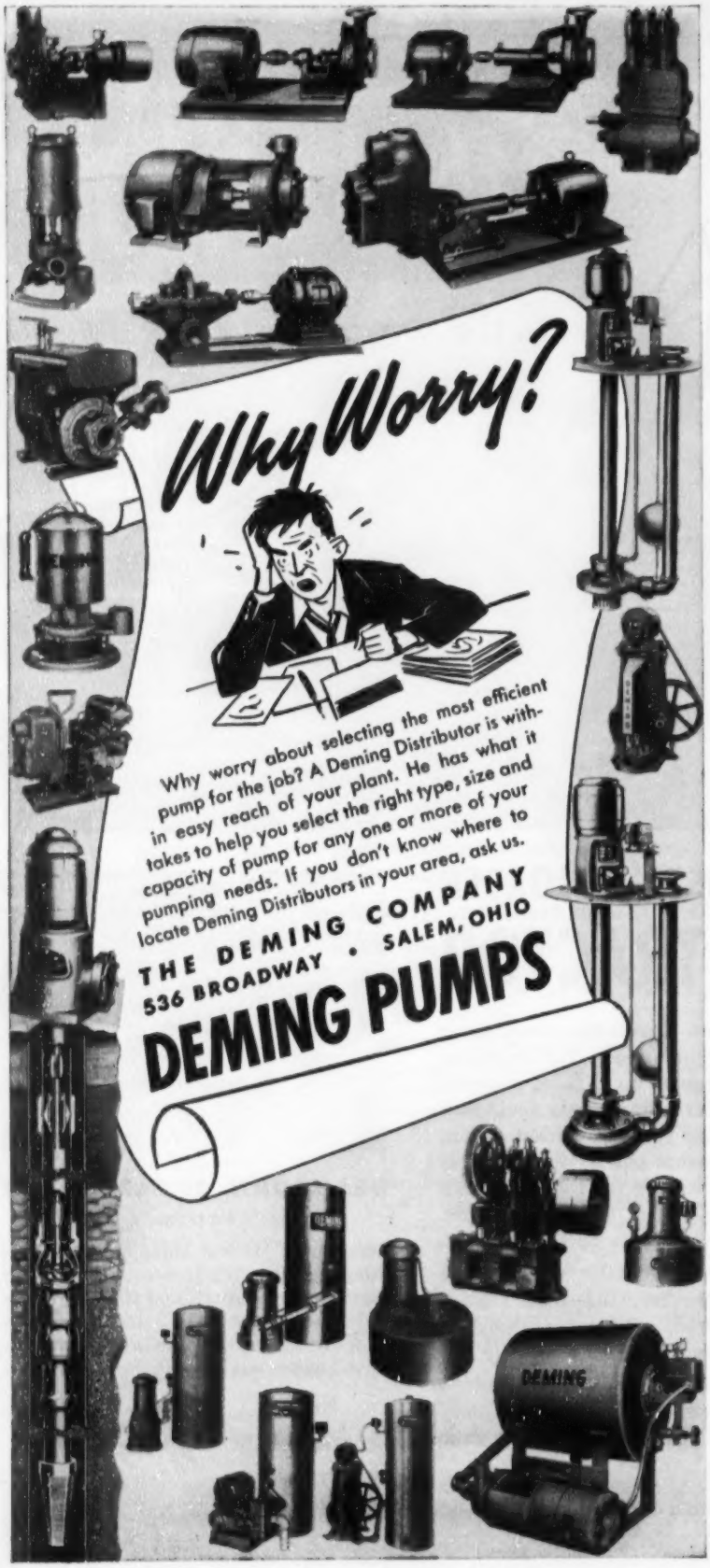
Ford TRACTOR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Type II cements. The fly-ash was used to replace 25% (by weight) of the cement. Compressive strength at 3, 7 and 28 days was compared with that of a controlled mix of straight portland-cement concrete. With Type I cement, the control mix showed strengths of 2,273, 3,167 and 4,492 psi at 3, 7 and 28 days. The fly-ash mix with the greatest strength showed corresponding readings of 1,932, 2,801 and 3,933 psi. The other mixes showed lower values down to that of the poorest sample, which had readings of 1,158, 1,737 and 3,033 psi.

With the Type II cement, the control mix showed strengths of 1,556, 2,277 and 3,425 psi at 3, 7 and 28 days. The first of the two fly-ashes mentioned above showed mix strengths of 1,427, 2,022 and 3,458 psi; the second showed readings of 930, 1,415 and 2,442 psi. It should be pointed out that the fly-ash concretes probably will continue to gain strength over a much longer period of time than straight portland-cement concretes.

WILLIAM J. LNENICKA
Department of Civil Engineering
Kansas State College
Manhattan, Kan.

CALENDAR

Annual Road School, April 19-22; and Conference on Road and Street Traffic Control, April 22-23, Purdue University, Lafayette, Ind.

Conference on instrumentation in water, sewage and industrial waste treatment, Manhattan College, New York City, April 20.

Western Concrete Pipe Assn., Fresno Hacienda, Fresno, Calif., April 21-23.

Southern Industrial Wastes Conference, Hotel Shamrock, Houston, Tex., April 21-23.

American Society of Civil Engineers, Pacific Northwest Conference, Davenport Hotel, Spokane, Wash., April 22-24.

American Wood Preservers' Association 50th annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., April 26-28.

Pacific Southwest Conference ASCE, Senator Hotel, Sacramento, Calif., April 29-May 1.

Air Pollution Control Association, Patten Hotel, Chattanooga, Tenn., May 3-6.

Wire Reinforcement Institute, spring meeting Boca Raton Hotel, Boca Raton, Fla., May 3.

Concrete Reinforcing Steel Institute, Boca Raton Hotel, Boca Raton, Fla., May 3-8.

7th World Health Assembly, World Health Organization, Geneva, Switzerland, May 4.

Annual meeting, Steel Joist Institute, Boca Raton Club, Boca Raton, Fla., May 4.

Highway Transportation Congress, Hotel Mayflower, Washington, D. C., May 4-6.

American Welding Society, national technical meeting, Hotel Statler, Buffalo, N. Y., May 4-7.

Forest Products Research Society, national meeting, Grand Rapids, Mich., May 5-7.

Annual meeting, Building Officials Conference of America, Inc., Bellevue-Stratford Hotel, Philadelphia, Pa., May 10-13.

Engineering Institute of Canada, annual meeting, Quebec, Canada, May 12-14.

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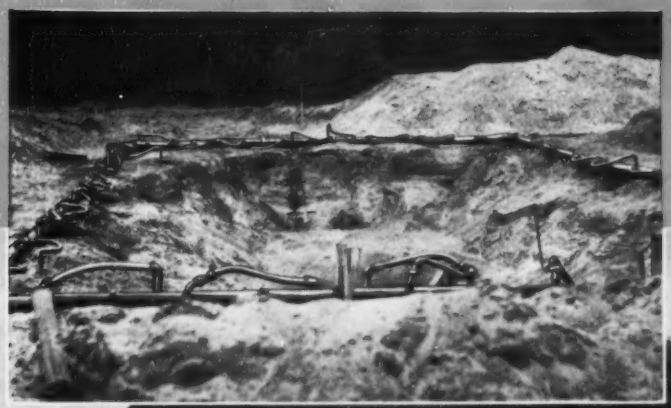

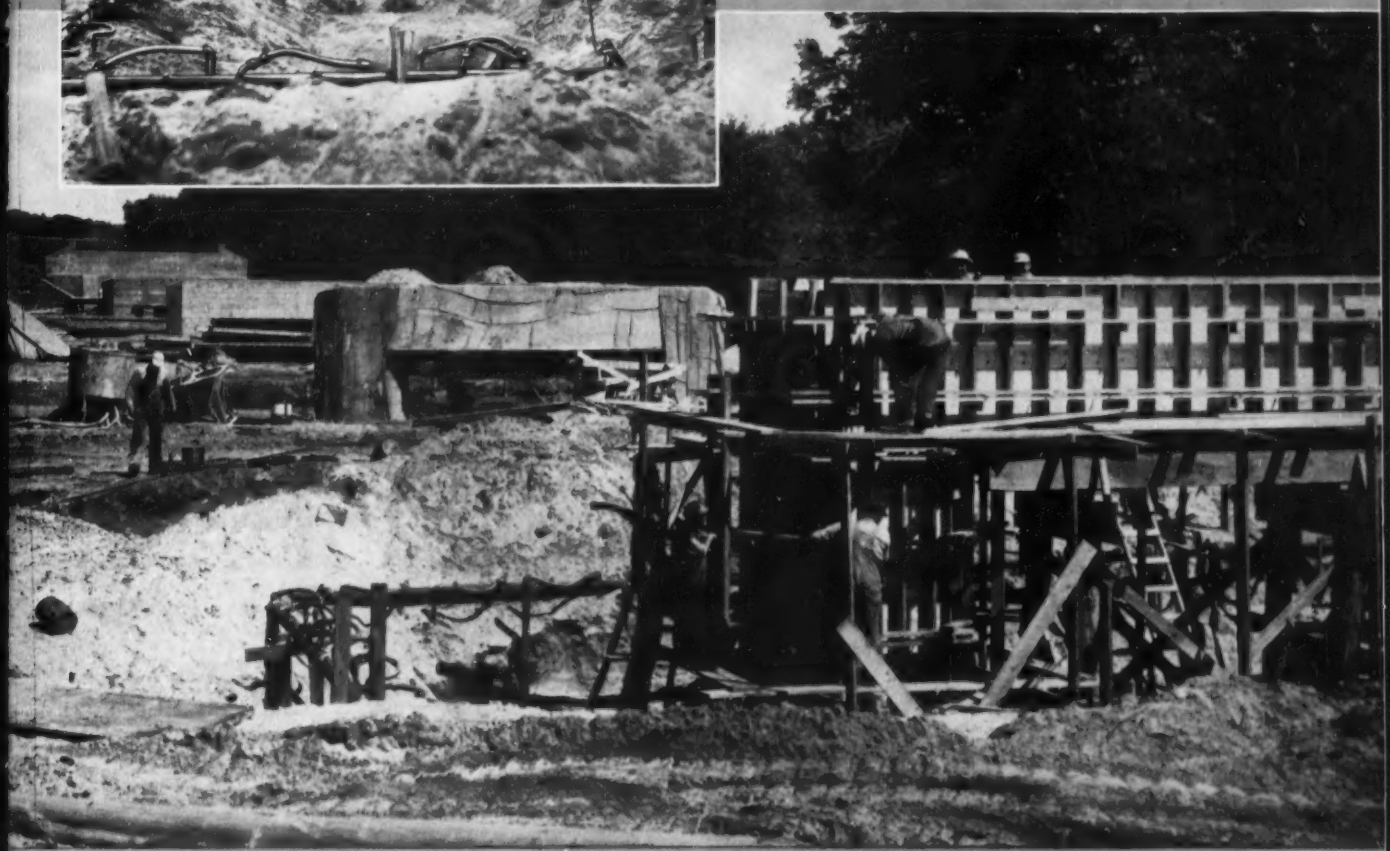

BRIDGE APPROACH PIERS, BLACK RIVER BRIDGE NEAR ONALASKA, WISCONSIN, FOR THE NEW MISSISSIPPI VALLEY SCENIC HIGHWAY, STATE OF WISCONSIN HIGHWAY DEPARTMENT

The saturated soil material on the jobsite was stabilized and predrained by installing a wellpoint system around the perimeter of the pier sites, as shown in the upper photo. A completed pier can be seen in the background and the second pier being formed is shown in the foreground with the wellpoint system in operation during construction.

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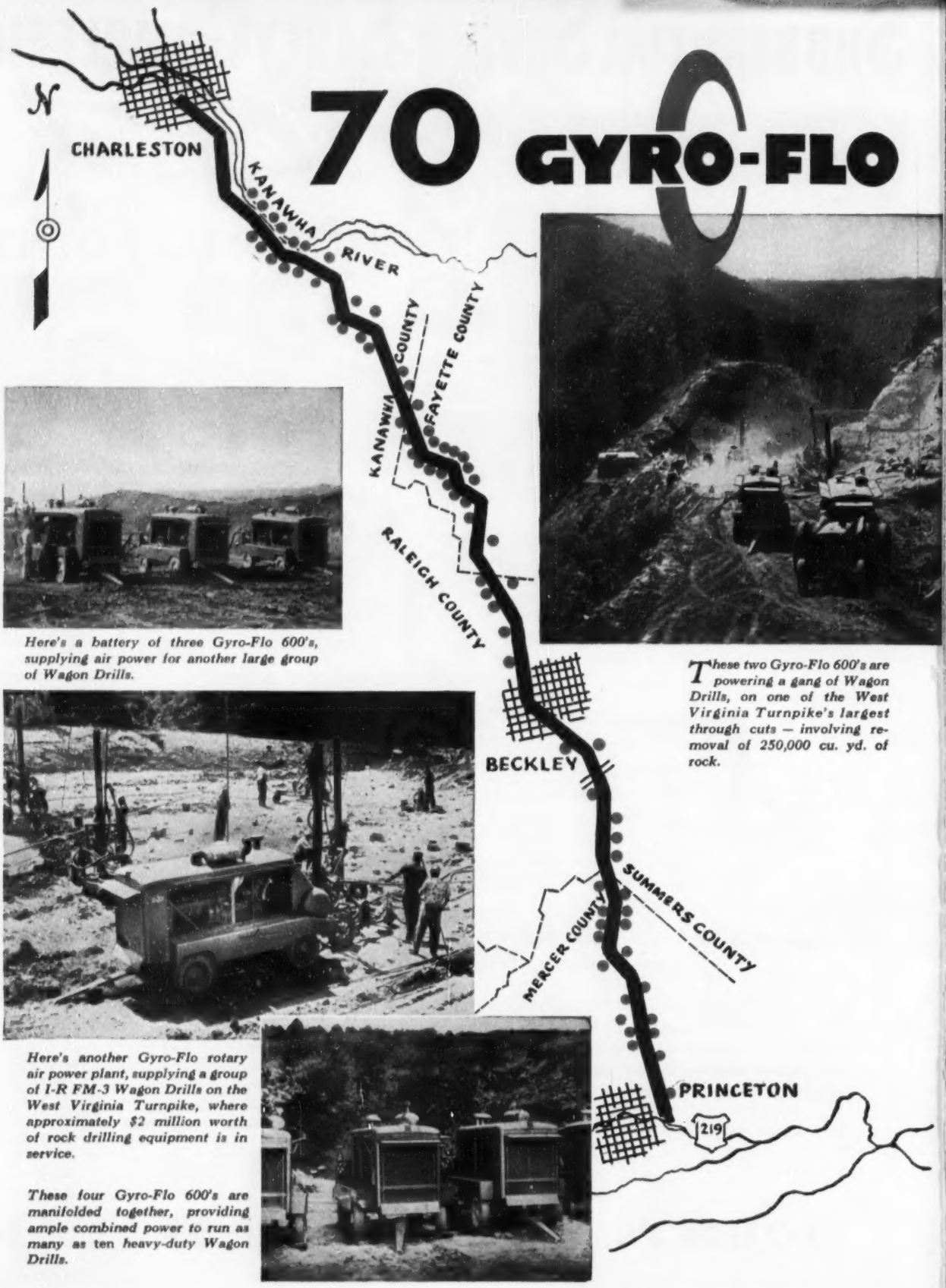

Here's a battery of three Gyro-Flo 600's, supplying air power for another large group of Wagon Drills.

These two Gyro-Flo 600's are powering a gang of Wagon Drills, on one of the West Virginia Turnpike's largest through cuts — involving removal of 250,000 cu. yd. of rock.

Here's another Gyro-Flo rotary air power plant, supplying a group of I-R FM-3 Wagon Drills on the West Virginia Turnpike, where approximately $2 million worth of rock drilling equipment is in service.

These four Gyro-Flo 600's are manifolded together, providing ample combined power to run as many as ten heavy-duty Wagon Drills.

COMPRESSORS

speed construction of 88 mile expressway through rugged West Virginia mountains

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Now available in 125, 210, 315 and 600 cfm sizes, there's a Gyro-Flo portable that's *right* for practically any construction job. Why not take advantage of their improved performance on *your* next drilling project. Your nearest I-R distributor or branch office will be glad to give you complete information on all sizes. Call him today —or write to Ingersoll-Rand for your copy of Bulletin No. 2321.

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Another reason you can count on the "OC-18" to add extra profit is Controlled Differential Steering. This steering principle gives you a two-track grip on the ground at all times. There's full power on every turn and steering is the same uphill, downhill, pushing or pulling.

The "OC-18" gives you more power for the money, too. Balanced design eliminates dead weight and puts every ounce of power to work at lowest fuel cost. In fact, the "OC-18" has the greatest power-to-weight ratio of any tractor in the 133 drawbar h.p. class. It's this design, too, that reduces down time and makes maintenance so simple and inexpensive.

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A complete line of industrial wheel and crawler tractors.

Vol. 152, No. 15

NATIONAL AFFAIRS

H-bomb tests emphasize need for structural protection ... 21
San Francisco Bay bridge-tunnel ... 22
Defense Department seeks authorization for $1.2 billion in construction work ... 23
Federal highway aid legislation ready for House-Senate conference committees ... 24
Synthetics move into building field ... 25
Seattle freeway may become first major city toll highway job ... 26
Starting date set for Kansas turnpike construction ... 26
New work scheduled on Utah's Weber Basin project ... 27
10-year road program to be mapped for North Carolina ... 27
Jobs of the week ... 27

LABOR

State's rights line: It's up to high court ... 28
Award due at disputed Little Rock Air Force Base project ... 28
Pay raise pact challenged ... 29
Paying by results in the Red orbit ... 29

FEATURES

Tunnel lining at an angle ... 30
Rolling for work solves speed problem ... 33
Prestressed-tile roof and girders make all-tile building possible ... 39
TVA launches bridges onto high piers ... 41

MUNICIPAL

Bridge face-lifting will speed San Francisco Bay traffic ... 44
Kansas City hits at congestion ... 48
Can cities condemn land? Connecticut court says yes ... 51
Hotel-recreation provided in 60-acre Ohio "office city" ... 51
$10.5-million industry site seen for Chesapeake Bay ... 52
California redevelopment law upheld ... 52

INTERNATIONAL

B. C. Power Commission blamed for landslide destruction of power plant ... 54

MEN AND JOBS

Prof. Douglas Trowbridge: retirement after 44 years at New York University ... 62
Maj. Gen. Stanley L. Scott: His 42-year military career ends at Ft. Belvoir ... 65
Barber-Greene moves top staff ... 65
John G. Butter takes over top Iowa roadbuilding post ... 66

BUSINESS AND FINANCE

Why ENR and Dodge disagree this year ... 92
Success of Pennsylvania Turnpike issue is good omen for builders ... 95
Activity this week ... 97

NEW PRODUCTS

Water treatment system is packaged ... 112
New interlocking hardware cuts forming time, costs ... 113
Large drawings put on conveyor belt ... 114
Rock rake aids in pavement removal ... 116

Reader Comment ... 4
Calendar ... 12
Washington Observer ... 19
Editorials ... 120
Obituaries ... 59
Books ... 66
Construction Reports ... 72

THE CONSTRUCTION WEEK

WARNING MONEY—Construction men have reason to pay close attention to Washington and Ottawa defense headquarters, now that its been revealed (by U. S. Defense Secretary Wilson) that the two nations are going ahead with construction of a new "radar fence" across the far north.

Reason: There's something approaching $400 million in U. S. funds alone to go into the project, which will stretch powerful radar monitors across a 1,200-mile area of northlands. And it's not hard to figure that a lot of the money will go for construction. Some of the new radar devices are reported to be able to detect intruders 200 miles away—which would indicate self-sufficient bases, probably with fighter airbases in conjunction.

WINDOW PERCENTAGE—It means little in this world of H-bombs and other cosmic problems, but construction men should be amused to know that John McShain Corp. of Philadelphia has won its battle of measurements with the Army Engineers for the District of Columbia.

The problem: On a new big office building at 13th St. and Pennsylvania Ave., Washington, McShain has installed an advertising sign for itself as each new pane of glass went into place. Engineer officials unearthed a district law that requires a one-dollar public sign fee for all displays that take up more than 20% of window space.

The result: Both sides whipped out their measures. McShain proved that, though its signs were big, the windows were bigger. The signs occupy only 13% of the available area.

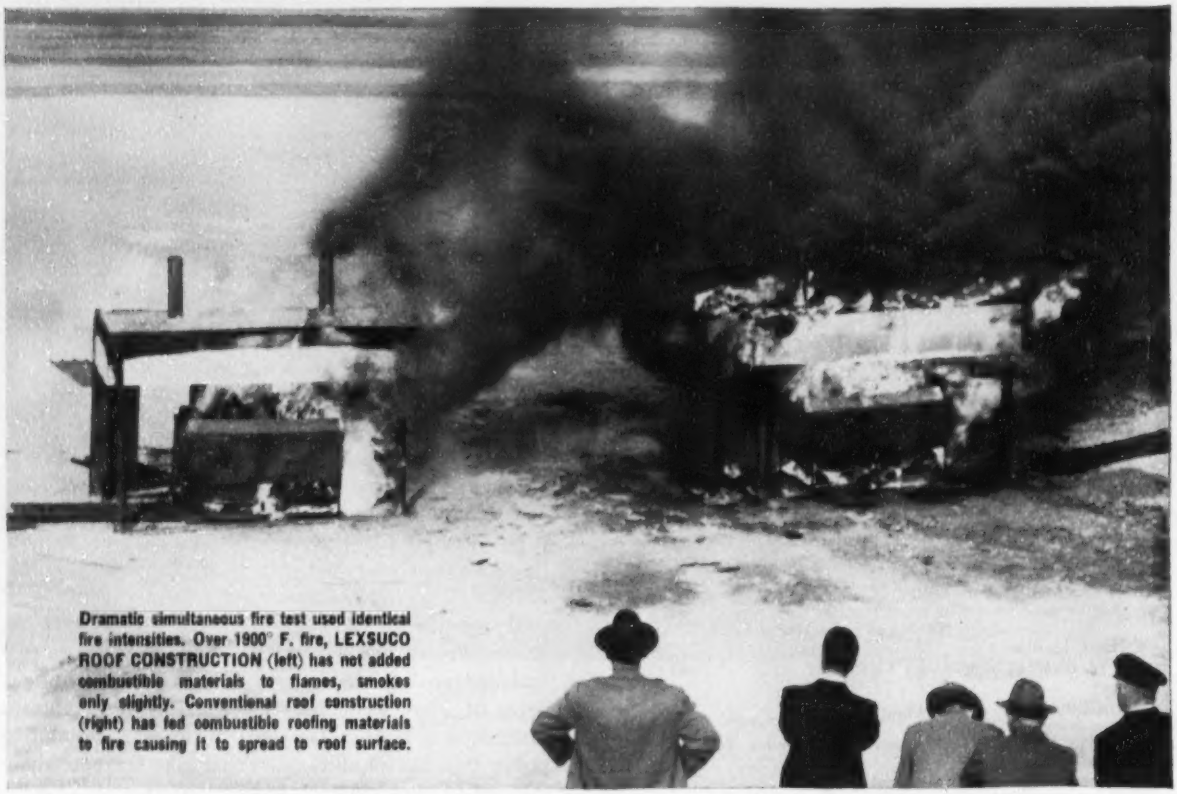
DAMAGES PASSED ALONG—At the insistence of contractor groups, North Carolina has canceled a ruling that required contractors to pay damages to the state if they fell behind construction schedules or failed to complete on schedule. Instead, a new regulation shifts financial responsibility from the contractors to their bonding companies.

Contractors complained that—under a system of awarding separate subcontracts—they might be penalized unfairly for slow work of another contractor.

NO RIDERS—That rider to the Independent Offices Appropriations Bill which would appear to prohibit use of federal slum-clearance funds on projects (unless they are principally for housing) got itself some doughty opponents this week.

Doughty opponent No. 1 was New York's many-jobbed Robert Moses, who in his capacity as construction coordinator for the city, saw the measure as blocking such projects as New York's huge new Columbus Circle development and other projects to the tune of $200 million or more. Said Moses: "We'll appear in Washington April 21, and kick like hell."

LEXSUCO *Engineered Products for the Construction Industry*



Dramatic simultaneous fire test used identical fire intensities. Over 1900° F. fire, LEXSUCO ROOF CONSTRUCTION (left) has not added combustible materials to flames, smokes only slightly. Conventional roof construction (right) has fed combustible roofing materials to fire causing it to spread to roof surface.

New Fire-Retardant Roof Design

Uses Koroseal Flexible Material as Vapor Barrier*

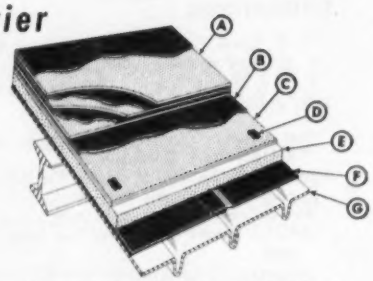
LEXSUCO announces one of the greatest improvements ever made in roof construction . . . a new fire-retardant roof which eliminates hazardous features found in conventional roofs—*at a cost no greater than that of standard roof design.*

LEXSUCO ROOF CONSTRUCTION will prevent "feeding" of combustible materials to fire below the roof. It removes two dangerous conditions: (1) dripping of inflammable asphalt into fire area and (2) burning of material between roof deck and insulation. These were contributing factors which converted a recent plant fire into a major industrial disaster.

LEXSUCO ROOF CONSTRUCTION incorporates a single-thickness Koroseal vapor barrier instead of the conventional two-ply barrier of asphalt-saturated felt mopped with asphalt. The Koroseal is a specially compounded, fire-retardant film, easily installed and lap-sealed with LEXSUCO Adhesive to provide a superior vapor barrier. Insulation and the Koroseal barrier are secured to any type deck with either LEXSUCO Insulation Clips or LEXSUCO Adhesive. LEXSUCO ROOF CONSTRUCTION employs standard roofing components and techniques and can be used over any roof deck.

Two full-scale tests using actual fire conditions have dramatically proved the fire-retarding superiority of LEXSUCO Roofs over conventional construction. For best protection of plant investment, for employee safety and for uninterrupted production, specify LEXSUCO ROOF CONSTRUCTION—it's yours at no extra cost!

For a complete "Technical Report" on the Lexsuco Roof Construction or for further information, write to: *Lexsuco, Incorporated, 4817 Lexington Avenue, Cleveland 3, Ohio.*



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- Ⓑ Mopping of bitumen
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- Ⓓ Lexsuco Insulation Clips
- Ⓔ Insulation
- Ⓕ Koroseal Vapor Barrier
- Ⓖ Steel Deck

*T. M. Reg. B. F. Goodrich Co.

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WASHINGTON OBSERVER

The housing scandal puts "fix up" promotion on its mettle. The revelations in Washington on Monday evening are bound to make homeowners wary. The charges:

Promoters connived with contractors in making exhorbitant estimates of the repair costs on which banks would make loans under Title I of the Housing Act. Now, homeowners are stuck with repayment of the loans—and the promoters and contractors have pocketed the difference between actual costs and loan totals.

Eisenhower and housing chief Cole are acting quickly to try to restore faith in "fix up"—the much-heralded means of sustaining the housing construction boom. FHA Commissioner Guy Hollyday has quit, and a full investigation is under way. Some Title I indictments were handed down in Los Angeles last week.

A probe of rental housing—the old Title 608—is going on too. The charge:

Builders made excessive cost estimates in qualifying for 90% loan guarantees on rental projects. Cole says he knows of $75 million of such excessive estimates, millions that presumably went into the pockets of builders.

This is an old allegation—one that even the sponsors of the emergency postwar legislation predicted they might face some day. But the investigation is going to be painful to some; Cole has rescinded the resignation of Clyde Powell, assistant commissioner in charge of rental housing, so that the inquiry can be complete. The worst example is said to be that of a 90% guarantee of an $8-million construction loan for a project that finally cost only $4 million.

•

Government research will spark two big construction projects. Some $7.5 million will be spent on a new center to develop an atomic airplane engine at Hartford, Conn., and the Army's Chemical Corps and the Department of Agriculture will build a $10-million laboratory on Plum Island, off the eastern end of Long Island—Agriculture to study hoof and mouth disease, Army to study some aspects of bilogical warfare.

•

Interior still is pushing contracts on saline-brackish water research. Just last week it gave two $80,000 contracts to two Cambridge, Mass., research organizations.

Badger Mfg. Co. will develop new compression distillation equipment which, according to Interior officials, may bring the cost of distilling fresh water from sea water to 30 or 40 cents per thousand gallons, compared with present cost of around $1.25–$1.50. At such a figure, they see a market for municipal and industrial use in such water-short areas as Southern California.

Ionics, Inc., will test its electrical membrane process on brackish water.

House Appropriations Committee cut fiscal 1955 funds for such research down to $255,000, from the Administration's request for $400,000.

•

Lease-purchase legislation is hung up over a congressional demand that public works committees pass on major government building contracts. But final enactment is pretty certain. The legislation will permit the government to lease privately constructed buildings, but acquire finally. The stimulant to construction is this: Congress has been cutting plans for new government buildings as part of its economy drive; under lease-purchase, the annual cost would be small and big construction would be possible.

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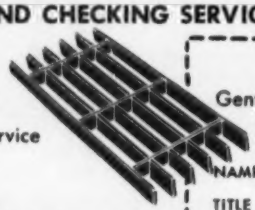

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H-bomb compels new look at blast design

Armed forces and Civil Defense offices develop low-cost protective measures against fringe-area structural damage

The big point for engineers and contractors in the scanty data thus far released on the H-bomb tests is that the fringe area, in which structures of conventional design may survive, has become more important than ever. This is also the area in which bomb shelters can be of greatest value in saving lives.

Although the area of total destruction has increased—enough to take out the heart of any large city—the uncertainty of its location makes it advisable to treat complete metropolitan areas as though they were potentially in the circle of partial destruction.

• **Structural improvements suggested**—The feasibility of making structures highly resistant to fringe-area blast at reasonable cost was pointed out last week in an exclusive interview by one of the few engineers who has had an opportunity to design and observe first-hand structures exposed to nuclear weapons. Arsham Amirikian, chief designing engineer of the Bureau of Yards and Docks, U. S. Navy, contends that structural strength and blast resistance of buildings can be increased as much as 100% at an added cost of only 5% to 10%.

Since information on forces released by nuclear weapons has been given to the public only in part, and the structural theory involved is difficult to apply, few engineers are able to make an accurate estimate of the blast resistance of buildings. However, Mr. Amirikian offers some suggestions which he has reason to believe might result in considerable structural improvement, although the exact amount will remain incalculable.

To eliminate the need for dynamic analysis (in contrast with commonly used analysis with static loading), Mr. Amirikian proposed 20 simple rules that engineers can put to use immediately. These are summarized briefly beginning on this page.

• **Army engineers making tests**—In the meantime, the Army Corps of Engineers also has made and is continuing studies on blast resistance—both for the Defense Department special weapons project and for the Federal Civil Defense Administration. FCDA is being supplied with data for a manual to assist engineers in designing structures, probably based on static analysis with correction factors for dynamic effects—similar to the methods used in seismic design. The procedure would apply to structures strengthened at low cost against fringe-area blasts, as well as to the highest type of blast-resistant construction.

• **Dispersal plans**—The increase in area of destruction with H-bombs has made more urgent dispersal of defense-production facilities. But to date there is no evidence that the federal government is going to change policies based on experience with the comparatively puny A-bombs of the last decade.

The Office of Defense Mobilization has drawn boundaries around some 70 critical target areas—large metropolitan complexes taking in 92 cities. For the purposes of dispersal, plants must be 10 miles beyond these boundaries, not just 10 miles from the downtown area.

The federal government is doing what it can to encourage dispersal, particularly for plants producing defense items or important raw materials. But officials of ODM, FCDA and the Defense Department admit that the government has little incentive to offer or leverage to force a company to build away from metropolitan areas.

ODM has made surveys that show that about 80% of companies getting quick tax write-offs for expansion are already building on dispersed sites. Along the same line, a study of ENR contract awards last year indicated a trend toward construction of new large plants away from existing industrial centers (ENR Feb. 19, 1953, p. 271). However, there appeared to be a tendency for smaller plants to remain near those centers.

Tax amortization—100% over a five-year period—is also available to companies that will incorporate in new plants bomb shelters for employees and suitable protection for essential equipment. But so far only two companies have taken advantage of this incentive.

How to design for H-blast fringe areas

Based on his experience with structures that have been subjected to A-bomb tests, Arsham Amirikian, chief designing engineer of the Bureau of Yards and Docks, U. S. Navy, has developed a set of simple rules for the design of buildings to resist blast in the fringe areas of nuclear explosions.

These suggestions are especially valuable since theoretical structural analysis of blast effects is extremely difficult.

Here is what you can do to improve blast resistance perhaps 100% without increasing construction cost more than 5% or 10%:

(1) Plan the building to conform preferably to a rectangular layout, with the width equal to at least one-third of the length. If a greater ratio of length to width is necessary, install transverse shear walls spaced at intervals not greater than three times the width of the building.

Arsham Amirikian

MAIN FRAMING

(2) Make the main framing rigid or continuous; this design eliminates use of simply supported members.

(3) Main framing may consist of a series of rigid bents, continuous frames, arches or shear walls. In general, these frames should span across the lesser dimension of the building, thus providing needed strength in the weak direction of the structure.

(4) To provide direct support to the secondary framing, maximum spacing of main frames shall preferably be 20

. . . Design for H-blast fringe area

ft and in no case should they exceed 25 ft.

(5) Framing should consist of either reinforced concrete or structural steel. Reinforced concrete may be conventionally cast in place, precast, or prestressed. Steel framing shall preferably employ welded construction.

(6) All joints of the framing should be designed with moment- and shear-resisting capacities. This is of particular importance in the connections joining the vertical and horizontal elements at the periphery of the building. Connections between columns and foundations should develop a moment strength not less than that corresponding to 50% fixity at the bases.

(7) Secondary framing should be connected to the main framing either by rigid connections or by full continuity over the supports. In steel framing, the desired continuity for purlins and girts may be obtained by a lapped arrangement over the supports. Such an arrangement will provide both continuity and efficient utilization of framing materials.

(8) In cast-in-place concrete construction, to assure full strength and continuity of the monolithic pours, some additional reinforcing should be provided at the supports for developing a moment-resisting capacity not less than 50% of that at the midspan of the member. It is desirable to have some of the top steel continuous across the full span of the member.

(9) In precast, prestressed concrete construction, desired moment capacity at the supports should be provided by means of metal inserts anchored in the elements and welded together in the final assembly.

(10) In steel trusses and arches, as well as in the bracing between frames and trusses, the connections should develop the full strength of the sections of the connecting members.

FLOORS

(11) Floor slabs should be integrated with beams or stringers. Where use is made of concrete slabs and steel beams or stringers, the slabs should have sufficient reinforcing in bottom faces to develop a positive moment strength over the supports equal to one-half that of the design negative moment. In addition, the slab should be securely anchored to the support in order to prevent shear slippage or pull-out.

(12) In precast concrete construction, floor slabs should preferably be cast with the stringers to form integral panels. Connections of such floor panels to each other and to the main frames should be made by means of metal inserts cast in the elements and welded together in the final assembly work.

(13) Where ceiling framing is required, it should be directly connected to the floor or roof framing. Use of suspended ceilings and loosely fastened ceiling blocks should be avoided.

ROOF FRAMING

(14) The local element of roof framing may consist of a poured concrete slab or precast panel. The concrete slab should be poured monolithically with the supporting concrete members, or secured effectively to supporting steel members, and should be designed for full continuity over the supports. Precast concrete panels should have rib stiffeners and anchored metal inserts for welded connections.

(15) Supporting members of the roof framing may consist of beams and girders of steel or concrete. The bottom face reinforcing of concrete beams should extend into the supports and be anchored or spliced for full continuity.

(16) Concrete girders should have top and bottom face reinforcing continuous between the supports, tied together with bands or stirrups through their span length.

WALLS

(17) Exterior walls should consist of moment- and shear-resistant framing or panels—eliminating the use of unreinforced brick or block construction for these walls. Precast, sandwich or ribbed-type panels may be used with adequate connections at the supports by means of welded inserts. For interior shear walls, preference should be given to relatively rigid type framing construction over masonry. Adequate anchorage or connections should be provided between structural partitions and framing.

(18) Windows weaken the strength of wall framing, and window glass constitutes a serious hazard under blast forces. For these reasons, openings should be eliminated or minimized.

(19) Exterior doors should preferably be located in the longitudinal walls. When necessary to provide doors and windows in the end or transverse walls, they should be located in the middle-third of the span or width of the wall.

(20) All exterior walls and interior shear walls should be securely connected to the foundations to resist uplift and overturning. Where the walls are supported on grade beams or spandrels, the latter members should be designed for bending and twist.

Bridge-tunnel, to cost $200 million, okayed for San Francisco Bay crossing

The California Toll Bridge Authority is prepared to start active design on the projected $200-million curved southern crossing of San Francisco Bay (ENR Nov. 12, 1953, p 23), following the granting of Army Engineer clearance last week.

Upon receiving word that the Army had ok'd the application, Gov. Goodwin J. Knight immediately named two nationally known engineers to serve as consultants to him in his role as chairman of the authority.

His consultants will be Richard E. Dougherty of Seelye, Stevenson, Value & Knecht of New York, and Daniel V. Terrell, dean of the College of Engineering, University of Kentucky. Dougherty is a former vice-president and engineering consultant of the New York Central Railroad and a past president of the American Society of Civil Engineers. Terrell is currently president of ASCE.

The governor also appointed Norman C. Raab as chief of the Division of San Francisco Bay Toll Crossings. Raab has been project engineer for the division and is now in charge of the Richmond San Rafael crossing under construction across the north arm of the bay.

It was stated that work on engineering studies, plans and specifications will begin immediately.

The route approved for the bridge extends from Army St. in San Francisco to the shore side of Bay Farm Island, curving some 500 ft south to provide flying room for a projected seadrome for the nearby Alameda Naval Air Station.

The state's first application to the Army Engineers for approval of a straight-line causeway and tunnel crossing between the two points was turned down on the basis of Navy protests that it would interfere with seadrome lanes.

The Army permit does not include approval of approach routes for the bridge; new applications must be made for any approach routes that will cross navigable waters.

The Army permit stipulates that the state may have to do some dredging to keep the Islais Creek channel, north of Army St., clear for shipping.

Defense Department seeks authorization for $1.2 billion in construction work

Many new projects could be ready for bidding this summer and fall—military's unobligated balance $2.5 billion

The Defense Department last week sent to Congress an Administration bill that would authorize $1.2 billion of military construction. Included in the bill are new authorizations of nearly $900 million for the three military services, plus more than $300 million of reprogramed authorizations for Air Force construction.

In addition, the Air Force is asking the Armed Services Committees of Congress to approve $200 million of overseas projects under a lump-sum authorization voted two years ago for the overseas airbase program. Including these projects, the present session of Congress is expected to add some $1.4 billion in all to the backlog of planned military construction.

• **Money at this session**—Money to pay for the requested projects is due to be voted at this session. House Armed Services Committee this week began approving requests. Speed of committee action indicates that bill will be ready for floor vote this month. The President listed a tentative estimate of $1.1 billion of new money for military construction in his January budget message (ENR Jan. 28, p. 21-22).

These additional appropriations will be needed to start construction of the projects described in the authorization bill. The military services have on hand an unobligated balance of about $2.5 billion of previously appropriated money, but little if any of this balance can be used to build the new work that Congress last week was asked to authorize. Nearly all of the existing unobligated balance is earmarked for previously designated construction, and most of that construction is scheduled to go forward.

• **Fast action predicted**—Fast action is looked for in taking bids on a good number of the new projects. Architect-engineer planning of many projects has been in progress for a year or more with special funds allotted to that purpose. Bids for some projects can be invited in July, at the start of the fiscal year, and bids for a goodly number could be taken by October. The requested program as a whole is expected to move rapidly to the construction stage.

Incidentally, the district office organization of the Corps of Engineers has an additional total now on hand of more than $500 million for Air Force and Army projects not yet put under contract. Bids for a big part of this backlog likewise will be taken soon—within limits of expenditure ceilings established by the White House.

• **Biggest chunk for Air Force**—Air Force construction is allotted the biggest share in the new authorization bill—nearly $433 million for new projects plus more than $309 million for reprogramed work—a total of $742 million. To that can be added some $200 million for Air Force overseas projects now being submitted for committee approval.

Of the $433 million of new Air

Reprograming and new authorizations for major Air Force projects

Base	Reprogramed	New authorization	Base	Reprogramed	New authorization
Abilene Air Force Base, Tex.	$2,760,000	$14,675,000	K. I. Sawyer Airport, Mich.		8,556,000
Altus AFB, Okla.	1,518,000	14,114,000	Southern California area		4,000,000
Barksdale AFB, La.	3,905,000		Traverse City area, Mich.		8,635,000
Castle AFB, Calif.	2,050,000	7,531,000	Alexandria AFB, Alexandria, La.	4,239,000	1,613,000
Clinton-Sherman Airport, Okla.	9,930,000	1,463,000	George AFB, Calif.	366,000	4,774,000
Columbus AFB, Miss.		3,558,000	Lawson AFB, Ga.	3,250,000	1,219,000
Davis-Monthan AFB, Ariz.	3,034,000		Mytle Beach Airport, S. C.	8,383,000	3,025,000
Dow AFB, Me.	3,782,000	8,288,000	Seymour Johnson AFB, N. C.	6,916,000	6,588,000
Ellsworth AFB, S. D.	4,364,000	2,810,000	James Connally AFB, Tex.	3,853,000	
Fairchild AFB, Wash.	6,796,000		Brookley AFB, Mobile, Ala.	3,814,000	
Forbes AFB, Kan.	2,176,000	7,853,000	Hill AFB, Utah	2,237,000	8,305,000
Great Falls AFB, Mont.	1,783,000	4,817,000	Kelly AFB, Tex.	12,713,000	
Homestead AFB, Fla.	10,768,000	4,641,000	McClellan AFB, Calif.	3,415,000	
Hunter AFB, Ga.	8,946,000		Norton AFB, Calif.	2,120,000	2,183,000
Lake Charles AFB, La.	6,141,000	3,136,000	Robins AFB, Ga.	6,427,000	10,138,000
Limestone AFB, Me.	12,359,000	3,363,000	Tinker AFB, Okla.	206,000	5,953,000
Lincoln AFB, Neb.	3,536,000	1,128,000	Wright-Patterson AFB, Ohio.	5,847,000	
Little Rock AFB, Ark.	227,000	12,338,000	Charleston AFB, S. C.	2,476,000	4,315,000
Lockbourne AFB, Ohio.	1,696,000	8,991,000	Dover AFB, Dover, Del.	1,694,000	1,654,000
March AFB, Calif.	2,432,000	6,340,000	McGuire AFB, N. J.	4,638,000	
Pinecastle AFB, Fla.	4,627,000		Edwards AFB, Calif.	11,286,000	16,192,000
Plattsburg Barracks, N. Y.	690,000	19,145,000	Hartford, Research Facility, Conn.		5,750,000
Portsmouth AFB, N. H.		14,079,000	Holloman AFB, N. M.	2,489,000	4,652,000
Smoky Hill AFB, Kan.	7,308,000	304,000	Kirtland AFB, N. M.	4,928,000	244,000,000
Travis AFB, Calif.	3,081,000	4,741,000	Laurence G. Hanscom AFB, Mass.		6,649,000
Turner AFB, Ga.	4,778,000	883,000	Patrick AFB, Fla.	6,463,000	
Walker AFB, N. M.	3,333,000	754,000	Eglin AFB, Fla.	6,149,000	
Bismarck Airport, N. D.		7,588,000	Galena Airfield, Alaska	50,000	6,312,000
Fargo area, N. D.		7,055,000	Ladd AFB, Alaska	2,223,000	
Glasgow Airport, Mont.		8,391,000	Various locations, Guam	8,071,000	
Klamath Falls Airport, Ore.		4,133,000	Hickam AFB, Hawaii	2,044,000	2,406,000

Force authorization, $312 million is for work inside the continental United States, and $110 million is for aircraft warning and control projects and classified construction. Less than $10 million of the new Air Force authorization is specifically listed for work located outside the continental U. S.

Army projects in the new bill total nearly $257 million, of which more than $87 million is for classified construction. Of the remainder, $150 million goes for projects inside the continental U.S., and less than $20 million outside.

Navy construction requested in the bill adds up to $207 million. The Navy total includes $63 million classified, $113 million inside the continental U. S., and $31 million outside.

The authorization bill cannot be said to reflect accurately the "new look" in national defense. Air Force projects, of course, do fit in with the announced program of having 137 wings in operation by June 30, 1957. But the projects in the bill were submitted by the armed services to the Defense Department before the National Security Council and the Joint Chiefs of Staff got to work on any revised plan of military alignment. Their thinking as regards any shifts resulting from the "new look" is more likely to show up in future legislation.

Major Army-Navy project authorizations, fiscal '55

Point aux Pins Ammunition Terminal, Ala.	$26,951,000
Naval Air Station, Alameda, Calif.	4,463,000
Naval Air Station, Miramar, Calif.	4,001,000
Naval Supply Center, Oakland, Calif.	3,051,000
Naval Petroleum Reserve Number One, Elks Hill, Calif.	8,000,000
Naval Construction Battalion Center, Port Hueneme, Calif.	4,669,000
Camp Carson, Colo.	7,491,000
Fort Benning, Ga.	8,199,000
Naval Auxiliary Air Station, Glynco, Ga.	6,531,000
Naval Training Center, Great Lakes, Ill.	5,564,000
Fort Riley, Kan.	7,413,000
Fort Campbell, Ky.	7,066,000
Lake Charles AFB, Lake Charles, La.	3,136,000
Naval Academy, Annapolis, Md.	5,680,000
Naval Shipyard, Boston, Mass.	3,400,000
Naval Air Turbine Test Station, Trenton, N. J.	5,209,000
U. S. Military Academy, N. Y.	10,447,000
Fort Bragg, N. C.	6,259,000
Fort Sill, Okla.	3,692,000
Marine Corps Auxiliary Air Station, Beaufort, S. C.	11,096,000
Fort Bliss, Tex.	13,453,000
Fort Hood, Tex.	10,182,000
Fort Belvoir, Va.	3,780,000
Fort Eustis, Va.	5,479,000
Naval Air Station, Oceana, Va.	4,696,000
Fort Lewis, Wash.	10,951,000
Naval Air Station, Whidbey Island, Wash.	4,245,000
Keflavik, Iceland	5,490,000
Okinawa	5,917,000
Naval Station, Subic Bay, Philippine Islands	12,506,000
Naval Air Facility, Cubi Point, P. I.	6,085,000
Naval Communication Station, P. I.	6,520,000
CLASSIFIED FACILITIES	
Army	87,700,000
Navy	63,358,000
Air Force—aircraft control and warning system	110,325,000

Federal highway aid legislation ready for House-Senate conference committees

Early enactment of an $800-million to $900-million federal-aid highway authorization is now in sight. The highway bill as passed by the Senate last week increased the total authorization and made several other changes in the House version, but the differences soon will be ironed out by conference committees.

On federal-aid authorization, the Senate raised the amount for fiscal 1956 and 1957 to $910 million per year, as compared with $800 million in the House bill.

Out of its larger annual total, the Senate version allocates $150 million a year to the interstate system, while the House bill assigns $200 million to it.

• **Fund distribution agreed**—After a bitter floor fight, the Senate went along with House action on the method of apportioning interstate funds.

Both legislative bodies now have approved the new method of distributing interstate money to the states: half on a basis of population and half in accordance with the regular federal-aid formula that gives equal weight to the three factors of population, area and post road mileage.

Both Houses likewise have okayed a more favorable matching ratio for interstate construction. Under this provision, the states would pay 40% of the construction cost and the federal government 60%, instead of the 50-50 matching required on other federal-aid construction.

The Senate version eliminated a clause in the House bill tying interstate aid to continuation of the two-cent federal gasoline tax. As the two-cent tax already has been extended by the excise tax bill recently enacted into law, the House will have no objection to dropping the much criticized "linkage" clause.

• **Anti-recession device out**—Also due to be dropped in conference is a so-called anti-recession device added to the Senate bill. This provision would allow the President to advance by one year the effective date for making federal-aid funds available to the states. Administration and House leaders consider the provision neither necessary nor appropriate in a federal-aid highway bill.

Other Senate changes in the House bill would: (1) authorize the Secretary of Commerce, rather than the Public Roads Commissioner, to make a study of problems of relocating public utility services on federal-aid projects; (2) direct the Public Roads Commissioner to make a financial study of the cost of completing highway systems in the various states; (3) authorize $10 million more for defense highways (in addition to $50 million at present authorized but never used), and (4) direct the commissioner to consult with the Civil Defense Administrator on civil defense aspects of highway construction.

None of these changes will cause any delay in conference. Nor is there any prospect of delay in reaching a compromise on federal-aid allocations for the separate systems.

Here are the allocations voted for the respective systems (in millions of dollars):

	House	Senate
Primary system	$270	$342
Secondary system	180	228
Urban system	150	190
Interstate system	200	150

Both versions of the bill give federal-aid totals much greater than the $575-million authorization which is at present in effect for fiscal 1954 and 1955.

For other federally financed highways, the Senate version would authorize $90 million and the House bill $75 million, making the overall annual total $1 billion for the Senate draft and $875 million for the House measure.

Synthetics move into building field

Manufacturers describe new building materials and wider applications for older products at Cleveland conference

New developments in rigid vinyls as structural materials, in latex mastics for flooring and roofing and in oxychloride cements were spotlighted at the Cleveland Engineering Society's annual construction conference last week.

• **Future for plastics**—J. F. Malone, product engineer, B. F. Goodrich Chemical Co., Cleveland, pointed out new horizons for rigid vinyl in construction. This unique material was first introduced to the U. S. about 1950. Technically, it is an unplasticized polyvinyl chloride, which may be obtained either as a normal or a high-impact compound.

European experience with PVC indicates that it has excellent aging properties, even in outdoor applications. It has good chemical resistance. It is easy to fabricate with simple metal working and woodworking tools. Its high tensile strength and good impact resistance enable it to function successfully as a structural material. U. S. experience with PVC has been more limited but equally satisfactory.

While PVC has been used previously in the chemical handling field, Mr. Malone believes that it has other possibilities besides. Already, he said, numerous installations have been made for testing rigid vinyl in construction. These include house siding, roofing, gutters and downspouts, roof flashing, wall panels, storm window sash, gas lines, and oil and salt-water disposal pipes.

• **New latex floorings**—Charles R. Watt, vice president, Crossfield Products, Inc., Roselle Park, N. J., called attention to the development of improved latex mastic compositions for floors and roofs during the last decade. Since 1940, replacement of natural rubber by synthetics in these compounds has resulted in finished surfaces with higher resistance to greases, oils and ozone and better uniformity of product, he said. Experience with latex mastics on weather decks of ships indicate they could cut maintenance to a negligible amount, compared with materials commonly used.

If latex mastic compositions are compared with a concrete mix, the latex might be considered to take the place of water; a dehydrating powder is the counter part of portland cement; and granite, silicas and marble serve as aggregates. The compositions may be classified as (1) a trowel finish type for use as floor covering for industrial plants; (2) a trowel finish type for use on traffic-bearing decks; (3) a decorative type, containing marble chips, or a terrazzo; (4) an underlayment or leveling compound; and (5) moisture-proofing compounds.

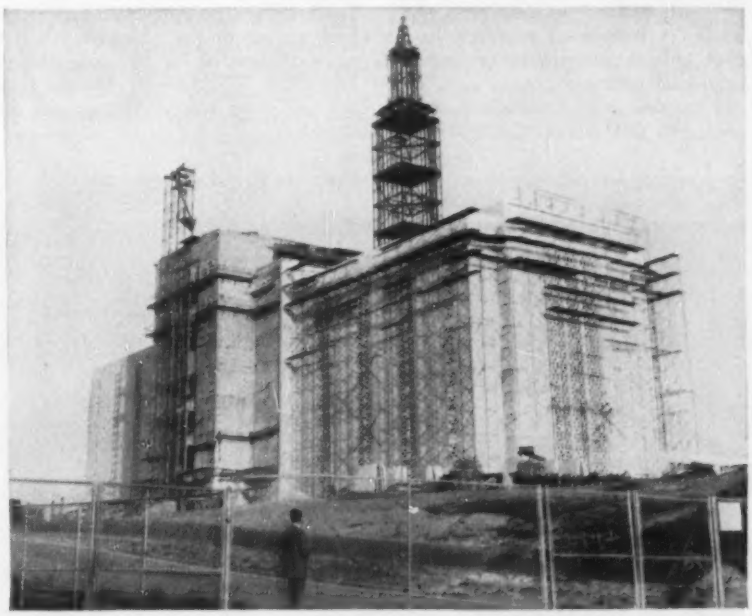
Proper specification of latex composition, Mr. Watt contended, will solve many industrial problems, such as waterproofing; protecting concrete slabs from acids and alkalies; non-slip surfaces for safety; resilient floors for reducing employe fatigue and for improved acoustics; and controlled electrical conductivity for dissipation of static charge. He suggested that when a latex mastic floor is being considered, the manufacturer of a proved brand material be contacted and permitted to recommend an experienced flooring contractor.

• **Progress with an older material**—J. B. James, executive secretary, oxychloride Cement Assn., Washington, D. C., offered the conference a new look at an old flooring material. In the last ten years since the formation of the OCA, he said, 28 standards have been developed for various applications of oxychloride cement for flooring compositions.

This cement is a chemical composition of caustic calcined magnesium oxide and magnesium chloride, which in solution forms a cement of unusually high strength capable of binding many materials together.

Introduction into the solution of aggregates and fillers in different percentages results in oxchloride compositions that posess a variety of physical characteristics. Compressive strength may range from 4,000 to 6,000 psi and flexural strength from 1,400 to 1,600 psi.

The conference also was introduced to a new aluminum roof deck by M. G. Winter, product manager, Reynolds Metals. Co., Louisville, Ky.



Temple is Los Angeles' second tallest building

The $4-million, 260-ft-high edifice of the Los Angeles Temple of the Church of Jesus Christ of Latter-Day Saints (Mormon) is second in height only to the L. A. City Hall. Although as an earthquake safety measure, the L. A. building code limits buildings to a 150-ft height, towers with proper setback may exceed this height. The main part of the temple is 112 ft high and is topped by a 133-ft tower that will support a 15-ft statue. The structural steel frame, erected by Consolidated Western Steel Corp., is encased in reinforced concrete. The entire building is faced with precast slabs of crushed quartz embedded in white portland cement. Included is an assembly room that will seat 2,600 persons. Under construction since October 1952, the building is scheduled for completion in October 1955. The temple was designed by Architect Edward O. Anderson, of Salt Lake City, Utah. The church is acting as its own general contractor with Thorne N. Jacobsen as supervisor of construction. Jacobsen heads Jacobsen Construction Co., general contractors of Salt Lake City.

Freeway to toll?

65-mi Seattle project may become first major city toll highway job

A proposed $158-million, 65-mi freeway through Seattle, Wash., from Tacoma to Everett can be financed by tolls, consulting engineers Coverdale & Colpitts of New York have informed the Washington State Toll Bridge Authority in a preliminary report.

The highway would parallel U. S. Highway No. 99 and eventually be part of a trunk system of four-lane, limited access, divided highways from the southern to the northern border of the state.

The Seattle section of the route—which would be the first toll highway through a major city—would consist of eight lanes in three roadways. Three lanes each would be provided for traffic in either direction, with two lanes in the middle upon which traffic could be directed either north or south to accommodate peak traffic loads. A high level two-deck bridge over Lake Union would be included in this section.

Coverdale & Colpitts recommended that the authority engage financial consultants to review the results of the preliminary study. They would advise the authority whether all or part of the road can be financed by revenue bonds, assuming that final estimates of costs and revenues support preliminary findings.

If the fiscal agents report favorably, final engineering and traffic studies would require another year, after which construction would require from five to eight years.

An 85-cent toll for passenger cars was recommended for the entire length, with charges of 10 to 25 cents for various portions of the route. Trucks would pay an average of $1.38. Seven toll stations are proposed, including three within Seattle, and 19 interchange points.

A motorist on the highway probably would be given a toll ticket upon entering the road and pay when he left, according to the distance traveled.

Turnpike to get tunnel

The Pennsylvania Turnpike Commission will construct a tunnel in the Leighton area to carry traffic through high ground on the 110-mi northeastern extension of the toll road (ENR Jan. 24, p. 27). Officials say the tunnel will help avert a fog menace in the area.

Kansas turnpike

Engineering reports are favorable to starting work about Oct. 1

The Kansas Turnpike Authority has set an Oct. 1 target date for starting construction of its $140-million, 234-mi toll road from Kansas City southwest to the Oklahoma border (ENR March 25, p. 26).

A number of encouraging factors emerged from a meeting of the turnpike officials and their consulting engineers last week. The authority obtained a promise from engineers that aerial surveys would be completed in two weeks to pinpoint 30 mi of the proposed route. And, assurance was given that a feasibility report would be ready Aug. 1.

The authority also was told that its $140 million in revenue bonds could be offered to the market 45 days after receipt of the engineering report. Four investment banking groups already have been asked to submit proposals for management and sale of the issue.

Arrangements were made for a test case in the Kansas Supreme Court to ascertain the validity of the turnpike act.

Henry E. Breed dies: Storm King road builder

Henry E. Breed, 76, civil engineer, former president of the American Road Builders Association and builder of the famous Storm King Highway above the west shore of the Hudson River, died at Cornwall, N. Y., April 6.

Mr. Breed designed and supervised construction of the Storm King Highway during World War I while serving as N. Y. State First Deputy Highway Commissioner.

The two-lane highway, four miles long, was hewn out of solid rock on the face of Storm King Mountain, whose highest peak towers 1,340 feet above the river. At many points the highway is half-way up the precipitous cliffs. The project took four years to complete.

In addition to his activities as a builder, Mr. Breed was widely known for his writings and as a teacher. From 1920 until 1938 he was an associate professor of highway engineering at New York University, and lectured on highway building techniques at the University of Maryland, the University of Michigan, Cornell University and Yale University.

From 1929 to 1930 Mr. Breed served as chief engineer for a group of American road builders who made a survey of 600 miles of highway and city streets in Moscow.

Flood control dam to be dedicated

Texarkana Dam, a single purpose flood control project on the Sulphur River near Texarkana, Tex., will be dedicated by the Corps of Engineers on April 17. Built at a cost of $33 million, the rolled earth embankment will store 2,500,000 acre-ft of flood water. Photo shows spillway at left and outlet structure, center. Major project in the Red River flood control program, the dam will be completed in the current year. Joint-venture contractors were Edward Peterson Co., Omaha, Neb.; Foley Bros., Inc., St. Paul, Minn.; and Tellepsen Construction Co., Houston, Tex.

Weber Basin jobs

New work scheduled on Utah irrigation scheme as tunnel is completed

Three jobs costing a total of $20 million will go under contract soon on the Weber Basin reclamation project in Utah, following the recent holing through of the 3.3-mi-long Gateway Tunnel in the Wasatch Mountains near Ogden.

The 9-ft 4-in. horseshoe-shaped tunnel is the key part of the project which will irrigate more than 50,000 arid acres and supplement present irrigation on another 24,000 acres. The largest reclamation project ever authorized by Congress for Utah, the $71-million Weber Basin plan ultimately will provide 270,100 acre-ft of water annually, of which 40,000 acre-ft will be used for municipal and industrial water supply.

The basin lies on the northeast corner of Great Salt Lake, and its development is designed to meet all foreseeable requirements in Ogden and some 20 sizable communities surrounding the city. The program calls for the creation of three new reservoirs, enlargement of two existing reservoirs and integration of another.

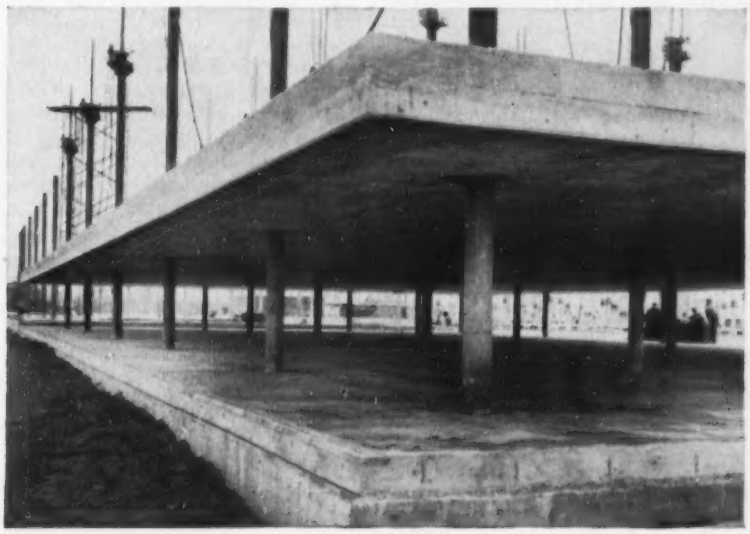
Reservoirs will provide capacity to equalize the severe fluctuation in the flow of the Weber Basin streams. An 8.5-mi canal (the Gateway) will supply water from the Weber River to both a power plant and to the recently holed-through Gateway Tunnel, which, in turn, will carry the flow to two aqueducts, one 5 mi long and the other 23 mi long, for irrigation and water supply.

Before June 30, contracts will be let for the $5.5-million Wanship Dam, an earth structure 158 ft high and 1,900 ft long; for the $9.6-million, 23-mi-long Davis aqueduct; and for the $5-million Gateway Canal.

10-year road program to be mapped for N.C.

The North Carolina Highway Commission is having a survey of the state's overall highway needs for the next 10 years made by the New York engineering firm of Parsons, Brinckerhoff, Hall and Macdonald.

The survey report, due Nov. 1, will be the basis of recommendations to the 1955 session of the state legislature. It will involve an appraisal of the adequacy of all highways and bridges under the commission's jurisdiction and an evaluation of the cost of improvements and maintenance requirements year by year over the next decade.



Going up—section of a 250,000-sq ft lift-slab job

In sections around 8,000 sq ft in size, a record 250,000 sq ft of roof and floor lift-slabs are going into the construction of four buildings at the new RCA plant just outside Camden, N. J. The sections of lift-slab are raised 3 ft per hour on circular steel columns and are finally supported by welding steel collars (set in the bottom of the slab) to the columns. Slabs were placed on ground with a plastic sheet as separation between each section. Two consoles working in tandem raised each section on the 24 columns. Walls of the two- and three-story buildings will be of prefabricated panels with a brick exterior and an insulated porcelainized steel panel interior finish. Architect for the buildings is Vincent G. Kling, Philadelphia, Pa.; Turner Construction Co., New York, is the general contractor, and the Ohio Lift Slab Co., Cleveland, carries out the lifting operations.

Jobs in the news

HYDRO TUNNEL—A $56-million joint contract for the construction of a 14-mile tunnel 21 ft in dia and 1,800 ft below the surface has been let by the Snowy Mountains Hydro-Electric Authority, Cooma, Australia, to Kaiser Engineers, Inc., Oakland, Calif., Walsh Construction Co. and Raymond Concrete Pile Co., both of New York, and B. Perini & Sons, Inc., Framingham, Mass. The tunnel will divert 300,000 acre ft of irrigation water under the continental dividing range from Eucumbene to the Tumut River and will supply water for a 320,000-kw hydro plant.

AIRCRAFT PLANT—Contract for construction of a helicopter plant estimated to cost $17.5 million has been awarded to E. & F. Construction Co., Bridgeport, Conn., by the Sikorsky Aircraft Division, United Aircraft Corp., Bridgeport. Albert Kahn, Inc., and Fairbrother & Meihls, both of Detroit, Mich., are consulting engineers.

OFFICE BUILDING—A $9-million, 25-story office building will be built in Manhattan by Uris Brothers, New York, with their own forces. Emery Roth & Sons are architects.

SEWAGE PLANT—Contract award of $5 million for the construction of the Millcreek sewage disposal plant has been made by the city of Cincinnati to H. W. Miller Construction Co., Covington, Ky.

APARTMENT BUILDINGS—Two apartment buildings, 15 and 18 stories respectively and estimated at $5 million, will be built by Depot Construction Co. for the Two Tudor City Place Corp., both of New York. William I. Hohauser, New York, is architect.

LOW-RENT HOUSING—A $4-million contract for the construction of the Jordan Downs low-rent housing project, Los Angeles, Calif., has been awarded to Hagstrom Construction Co., St. Paul, Minn., by the Housing Authority of Los Angeles.

AIR BASE BUILDINGS—Contract for $4-million worth of buildings at Ladd Air Force Base, Alaska, has been awarded to Grove, Shepherd, Wilson & Kruge, New York, by the Corps of Engineers, Seattle.

RIVER IMPROVEMENT—A $3-million contract for a section of the San Gabriel River Improvement, Los Angeles County, Calif., has been awarded to A. Teichert & Son, Inc., and M. J. Bevanda, Baldwin Park, Calif., by the Corps of Engineers, Los Angeles.

State's rights line: It's up to high court

For the third time this term, the U.S. Supreme Court is faced with a tough line-drawing job: just where is the line that separates federal and state jurisdiction over employer-union troubles?

This week, the court heard arguments on the issue by the Laburnum Construction Co. (Richmond, Va.) and the United Construction Workers, which is a division of the United Mine Workers' catch-all affiliate, District 50.

On the employer's side the argument is that granting supremacy of federal over state regulation of labor disputes does not take away common-law rights to recover in a state court damages for torts (wrongs) done by a union. This is the ruling by the Virginia Supreme Court of Appeals upholding an award to Laburnum of damages totaling $129,000.

On the union's side, the argument is that since the wrong complained of—loss of business profits without justification—is based on conduct that comes within a Taft-Hartley unfair labor practice, the employer's only relief is through the injunctive processes of the National Labor Relations Board.

In two other cases earlier this term, the Supreme Court was presented with challenges to supremacy of federal law over state forms of relief (ENR Oct. 1, 1953 p. 24). In one, the court knocked down arguments that an employer could use the power of a state court to enjoin picketing illegal under both T-H and state law; in the second, the court upset an injunction granted a construction company by the Alabama Supreme Court against picketing that is illegal under T-H.

But in both these cases, employers were using a labor law to support their case. In the Laburnum case, however, all parties—and the Virginia Supreme Court—agree that the alleged UCW conduct (coercion of employes) is within T-H unfair labor practices provisions and that Laburnum could have gone to NLRB for action.

The relief sought by Laburnum and granted by the Virginia court is not based on either state or federal labor law. Rather, it is based on common-law doctrines that award money damages for wrongful conduct resulting in loss of future profits by interruption or destruction of an established business.

Laburnum's trouble with UCW started when the union demanded recognition as bargaining agent for construction work on a preparation plant for a new coal mine being built for the Pond Creek Pocahontas Coal Co. in Breathitt County, Ky. Laburnum refused, citing an agreement with the Richmond, Va., AFL Building & Construction Trades Council to use only AFL labor.

There followed a series of events, which the Virginia court described as enough to show that because of insolent, abusive language and threats, Laburnum's employes—"greatly outnumbered"—were intimidated and afraid to work. As a result, the coal company, fearing that the disturbance might shut down its UMW-organized mines, canceled its contract with Laburnum and refused to accept future bids on additional construction work in the area.

Under questioning from Chief Justice Warren during the oral arguments, both union and company lawyers said there is no remedy for money damages of this kind available to employers in federal courts under the Taft-Hartley Act. And in answer to a question by Justice Frankfurter, union counsel said that even if there should be actual physical damage suffered by an employer in such a dispute, his only course of action is to go before the NLRB for injunctive relief.

But counsel for Laburnum insisted that the language of the law does not destroy the right to sue at common law for such damages in a state court.

Other justices seemed concerned that a conflict of remedies—which T-H is supposed to eliminate—might arise if such money awards were upheld. They pointed out that conceivably NLRB would say no unfair labor practice existed on certain facts and refuse to seek an injunction, while a state court in the meantime would grant money damages on the same set of facts.

What are employer's remedies under T-H?

The National Labor Relations Board awards money damages only in cases of back pay. Employers cannot get money damages from the NLRB. But an employer can sue a union in these secondary boycott situations listed by the Taft-Hartley Law:

- **Where a union forces an employer to join a labor organization or an employer organization or to stop doing business with another person.**
- **Where a union induces employes of one employer to strike or refuse to handle goods in order to force another employer to recognize it.**
- **Where a union strikes an employer for recognition when the employer is already dealing with a certified union.**
- **Where a union strikes to force an employer to assign particular work to employes in one union rather than to employes in another union (jurisdictional disputes).**

(Whoever is injured by these four activities—including employers of course—can sue either in a federal or a state court for money damages against the offending union.)

- **Where a union breaks a contract with an employer.**

(This last course is available only in federal district courts.)

Now, the Laburnum case now being considered has not been decided or argued on any of these theories. The employer is not suing on any of the T-H money remedies; or on any other T-H theory.

Nevertheless, all parties concede that Laburnum is suing the union under a section of T-H concerning coercion of his employes.

The question is: Since T-H doesn't provide for any money relief for that kind of violation, can the employer use a common-law theory anyway to recover?

Award due at disputed project

While Arkansas labor unions were still trying to force re-examination of a 1912 federal law that permits a 56-hr. work week without overtime pay on Little Rock (Ark.) Air Force Base construction, Army Engineers were getting set to award a paving contract at that installation.

The Tecon Corp. of Dallas, Tex., was apparent low bidder for part-concrete and part-bituminous surfacing of the runway, parking aprons and other areas at the Little Rock base. The bid was $4.1 million—about $273,000 under the government's estimate.

Work is scheduled to start 10 days after the contract is awarded.

Meanwhile, in Washington, action is pending on the effort of two Arkansas labor unions to exempt the base from restrictions of the 42-year-old law. Under this law, overtime pay on

certain military installations only is handed out for more than eight hours work in a single day. Thus it is possible to chalk up an eight-hour day, seven-day week without extra pay.

Contractors now engaged in initial grading and clearing work at the base are using the 56-hr week without overtime pay. As a result, the two unions have been picketing the job (ENR Feb. 18, p. 275).

Paving contractors at Little Rock predicted that the labor cost of the runway job would be raised by about $500,000 if bids were based on a 40-hr. week. Tecon Corp. officials refuse to reveal whether their figure is for a 56-hr. or 40-hr. work week.

Bids also were accepted under another schedule—one that called for all-concrete paving. The apparent low bidder in this category was the Wright Contracting Co. of Columbus, Ga. Their figure—$4.4 million.

Specifications for the project stated that Army Engineers could choose the all-concrete price—if it was within 5% of the part-concrete, part-bituminous bid. And since the Wright bid was 6.2% higher than the one made by Tecon Corp., the engineers said that Tecon probably will get the contract.

Pay raise pact challenged

California Gov. Goodwin J. Knight has been asked by the Associated Home Builders of the Great East Bay to investigate "to insure the absence of collusion" in an agreement which gave northern California cement masons a 7½-cent hourly pay increase.

The agreement, effective next Aug. 1, was between the northern and central California chapters of the Associated General Contractors and the AFL cement masons union.

It brings the pay of about 2,500 masons up to $2.74½ an hour, and involves about 500 AGC contractors in 46 counties.

As the first new contract of the year to be signed with the building trades by northern and central California AGC chapters, the agreement was under fire on the basis that "it was unprecedented in that it was arrived at more than 30 days prior to expiration of the existing agreement and after only one negotiating meeting."

John I. Hennessy, executive vice-president of the group in the Oakland-Berkeley area, wired the governor that the agreement "will cost taxpayers millions of dollars additional for highway construction and public works."

He said it was unwarranted in the light of "the cost of living, tax reductions," and an agreement with the painters union involving no pay raise.

Paying by results

Red nations evolving and extending incentive plan

Payment by results is not only highly developed in such countries as Russia, Poland and Czechoslovakia, but also is an inherent part of the planned economy of those nations.

The goals of Eastern Europe's post-war reconstruction policies depend upon increased labor productivity, and a revision of the payment system was considered imperative.

The result of this revision was an extension and reinforcing of the incentive system. Just how far this has gone has been reported by the International Labor Review after a study of information available.

The review, a bulletin of the International Labor Order, reports that in Russia's medium and key industries, the proportion of work done at piecework rates before the war corresponded to about 75% of all man-hours worked (against 57.5% in 1928). And judging by the many decrees and instructions issued since the war concerning the introduction and extension of the system, the number of workers now paid by results should be much higher.

Extent of payment by results may also be deduced from the official compulsory handbooks fixing piece rates and work unit values. In Russia, such handbooks cover 75-80% of all jobs in the building industry; in Poland, about 65%; in Czechoslovakia, about 80%.

Broken down still further, the 1944 Russian handbook of standard norms for the building industry covers nearly 5,000 jobs. This includes 224 for masons and bricklayers and related occupations; 217 for plasterers; 870 for concrete work and 980 for carpenters.

But the general trend seems to be to decrease the number of standard norms and to limit them to the most typical operations and conditions of work. In Poland, for example, the 1952 handbook covered 9,000 standard norms. The handbook under preparation now will cover 5,000 items.

In the initial stages of the system in Russia, standard norms were based on the results of past work. This was true also of Bulgaria, Czechoslovakia and Poland. But the effect on labor productivity was considered unsatisfactory. The need to increase output according to the planned targets and the rapidly changing technical conditions made frequent revisions in norms necessary.

Whenever standard times cannot be set up technically, a system called the "progressive average norm" is applied. The time allowed for a given output is based on the statistical average of the past results of all workers and the results of outstanding workers.

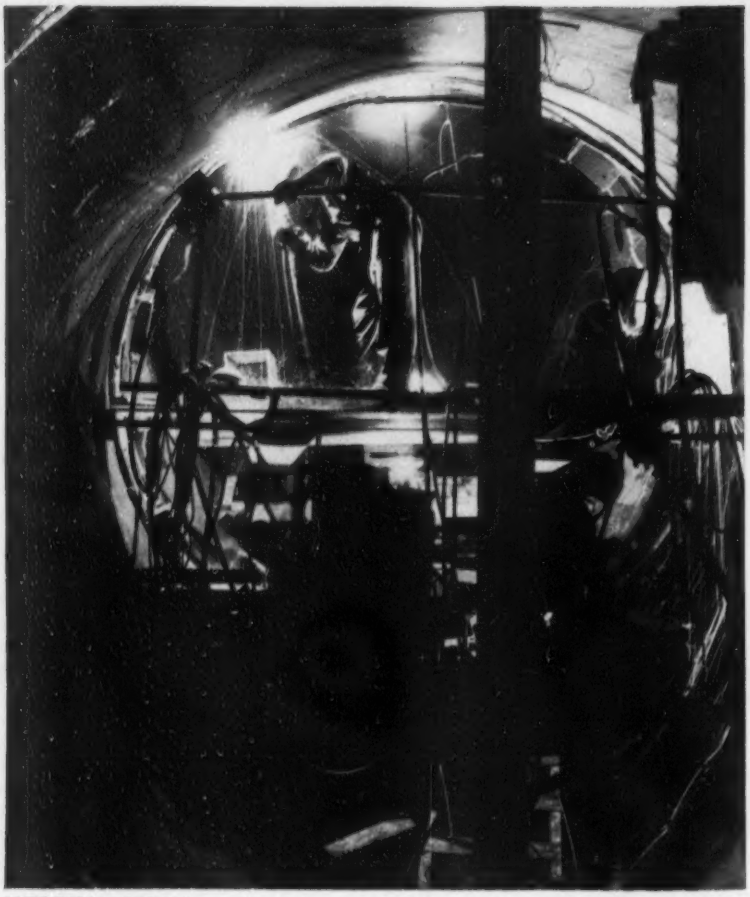
What are the economic effects of this scheme in Eastern Europe? The International Labor Review's report draws several conclusions:

- There has been a considerable increase in labor productivity. In Russia, labor productivity in construction was 36% higher in 1951 than in 1940. Poland reported at 17% increase in 1952 over the preceding year. But there is no means of knowing how much of this is due to the extension and improvement of the incentive systems, and how much to other factors.
- Planned reductions in construction costs have not been achieved in all cases. In the Polish six-year plan, provision was made for a reduction in building costs by 26%. In Russia, the government orders (as from July, 1950) the lowering of estimated construction costs by an average of 25%. Progress in both instances seems to have lagged behind the plans. The story seems to be the same in Eastern Germany and Hungary. However, it was not known if this is due to a failure to reduce materials or labor costs.
- A number of shortcomings in the setting of output norms and the fixing of wage and bonus rates (which have affected workers' earnings and labor productivity adversely) have been gradually eliminated in successive reforms.

$1,000 reward posted

Some half dozen locals of the Bricklayers, Masons and Plasterers Union (AFL), reacting to charges that they restrict the production of their members, have offered a $1,000 reward to anyone who can prove it. These charges claim that the local unions limit the number of bricks that can be laid during each day's work.

Commenting on the charges at the international union's headquarters in Washington, Bricklayers secretary John J. Murphy says any local found indulging in such a practice will be taken to task. Officials of locals restricting production "positively will be removed," he asserts.



WELDING CREWS use low-hydrogen electrodes. Steel is preheated to 400 F by electrical shoes expanded against steel on each side of joint. Back-up strips permit welding from inside only. Welds are stress relieved and radiograph inspected.

Tunnel lining at an angle

Kemano penstock, at 48 deg. inclination, is a special problem for hydro plant builders

Now nearing completion is one of the last major steps that will permit first power generation at the new Kemano, B. C., plant of the Aluminum Company of Canada, Ltd.: Installation of steel lining in the first of the planned four penstock tunnels (ENR Nov. 13, 1952, p. 31). The lining is backed with concrete formed by pumping special cement grout into preplaced aggregate. The 48-deg slope of the tunnel makes this no easy task.

Generators at Kemano will start producing power late this spring, and by mid-summer the initial aluminum facilities at Kitimat, 50 miles away, will be in full operation.

The penstock tunnel steps down the inside of the mountain at a 48-deg angle from the end of the power tunnel at El 2600 to the powerhouse at El 210. There is a horizontal section at El 1685 that permitted construction of the tunnel in two sections. One other identical penstock tunnel has been excavated but it will not be lined until a fifth generator is needed. Three are being installed now.

Thickness of the 11-ft dia penstock liner varies from $\frac{5}{16}$ in. at the top to $1\frac{1}{8}$ in. at the botton. The liner is designed to resist only part of the water pressure—the remainder will be resisted by the concrete backing and by the natural, unexcavated rock.

At the powerhouse level the penstock branches into four turbine manifolds each of 5 ft dia. Here the steel lining is much thicker ($2\frac{1}{2}$ and 3 in.) but installation methods are similar.

• Tough Job—Installing this steel in the limited confines is a difficult task. But the most exacting phase of the work is making and inspecting welds of the quality required for penstocks. And with the limited space available, this is not easy.

The penstock sections are transported in pieces from 14 to 28 ft long from Vancouver to Kemano by barge—a distance of 440 miles. At the Kemano dock, they are unloaded onto low-bed trailers for the 10-mile haul to the powerhouse. From there they are hauled up the mountainside to either the 1,600 or 2,600-ft level, on the spectacular 5,400-ft long aerial tramway that services the work (ENR Nov. 20, 1952, p. 42). Size of the penstock sections is limited by the 20-ton hoisting capacity of the tramway. Hauling the steel up the mountainside is done at night to minimize interference with other construction operations.

• Welded sections—At both El. 1,600 and El. 2,600, welding shops are set up that perform the first step in the installation procedure. Two pipe sections are joined using the automatic submerged arc process. Welding is preceded by pre-heating and, after radiograph inspection by use of Cobalt 60, the joint is stress relieved. This first welding is relatively easy and follows standard production methods. It's the underground welding that becomes difficult.

The assembled steel sections are brought to the inclined section of the 15-ft dia tunnel on small dollies. As the steel is rolled into the inclined tunnel, the dollies drop into a pit, so that the penstock liner can slide down skid rails when saddles attached to the pipe engage the skid rails. A 2-in. dia cable attached to the penstock section by a special yoke is used in the lowering operation.

Welding in the tunnel is accomplished by electric arc hand methods using low hydrogen rods. Work is done from the inside only; this being made possible by $\frac{1}{4}$-in. thick backup strips around the entire circumference. These strips are attached around half the circumference of the top end of a double section and around half the circumference of the bottom end of the next double section. The 2-in. projection facilitates mating of the adjacent units.

Preheating the steel underground is accomplished by electric shoes that are expanded against the pipe on each side of the joint. Temperature is raised to 400 F. Low temperature stress-relieving follows welding; it involves a slowly moving gas flame followed by a water quench. Rate of movement is varied with thickness of the steel.

Radiograph inspection of the welds

in the tunnel also involves Cobalt 60. A strip of film is wrapped around the outside of the entire weld. The isotope is positioned at the centerline and unsheathed long enough to expose the film. Any flaws disclosed are chipped out and rewelded.

• **Concrete backing**—Designers originally proposed to fill the void between penstock and tunnel excavation with conventional concrete. After considerable study, they determined that better control would be afforded by using the Prepakt method. And point-to-point contact of the rock minimizes contraction of resulting concrete.

Aggregate ranging from 1 to 3-in. size is placed in the space behind the steel liner—averaging 2-ft width. The rock is chuted into place by a 10-in. dia pipe that is kept full at all times to minimize breakage of the aggregate which would develop fines that are not wanted in Prepakt work. Aggregate is allowed to build up near angle of repose and is then worked under the penstock invert with air jets.

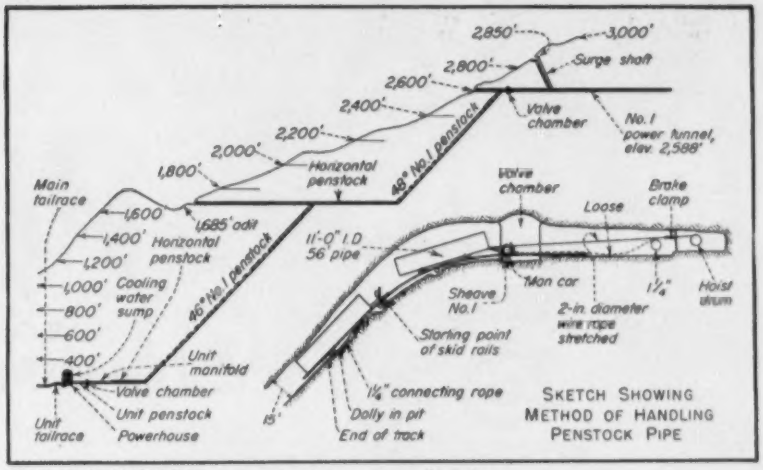
Grout mixture follows standard Prepakt methods. It includes cement, fine sand, an air entrainment admixture and Prepakt's "Intrusion Aid." This is a wetting agent that helps complete coverage of the aggregate.

Grout is pumped into the aggregate through grout nipples placed in the pipe during fabrication. Four holes are arranged around a horizontal plane. Grout is pumped into these holes until it comes through holes at a level 7 ft above. Then the grouting is moved up.

The upper part of the penstock section was grouted first. In the initial operation, 400 lin ft of steel penstock was placed, the external space backfilled with aggregate and grouted. This went so well that an 800 lin ft of penstock was welded and embedded the second time. This completed the upper end of the penstock. This too was successful—so much so that the entire 2000 lin ft of the lower penstock may be concreted in one continuous operation. In such case aggregate placement and grouting will proceed simultaneously.

Equipment for grouting is mounted on three interconnected platforms that are hauled up the penstock by a 60-ton winch. Grout is mixed at the bottom of the penstock section and pumped to an agitator in the middle of the three platforms. Here it is remixed—standard in Prepakt work to keep all grout materials in suspension prior to final pumping.

From the secondary agitator it flows by gravity to the lower platform where pumps force the grout into the rock. Top platform or jumbo is where the grout is actually introduced into the aggregate. Telephones interconnected the three levels.



PIPE IS LOWERED into penstock in sections 56 ft long or less.

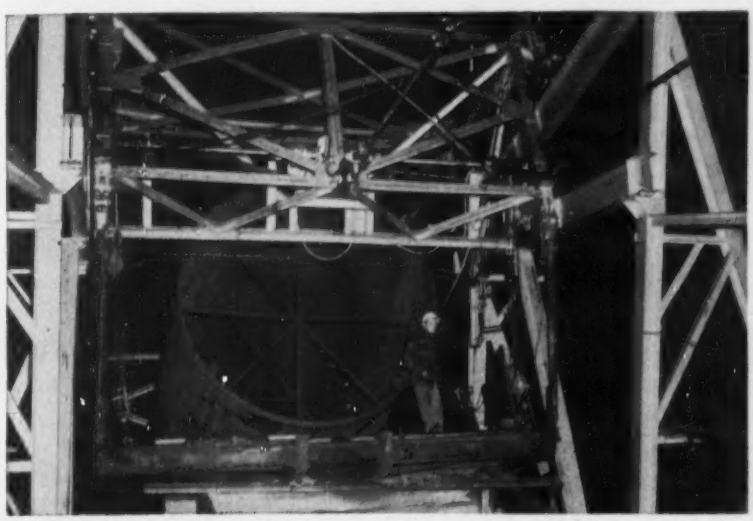
A minor deformation of the steel liner in the horizontal section at El 1,685 resulted from grouting pressure. While pumping the concrete slurry into the preplaced aggregate the 1⅛-in. thick steel shell bulged inward over an area 8-ft horizontal by 2-ft vertical. The 8-in. inward displacement occurred just below the horizontal axis.

In such a heavy Prepakt section, fast grout pumping is desirable for reasons of speed and grouting efficiency. But this tends to build up high grout pressures. Operators are instructed to reduce the pumping rate if and when pressure build up occurs. The operator in this case apparently did not catch the pressure build up in time. Normal grouting continued without interruption beyond the bulge until all of the section ready for grout was completed.

Steel in the deformed section will be cut out and replaced by a fitted section shaped to a slightly smaller diameter curve than the liner and slightly dished longitudinally to allow for welding contraction. No strain occurred outside the section to be cut out. The bulge is not expected to delay first operation of the power plant.

P. E. Radley is project manager of the British Columbia project for the Aluminum Company of Canada, Ltd. F. T. Matthias and J. S. Kendrick are assistant managers and H. C. Jenkinson is the chief resident engineer. Karl Roestad is resident engineer at Kemano.

Design of the hydro-electric features of the project is by British Columbia International Engineering, Ltd., with W. G. Huber, chief engineer. Construction is by Morrison-Knudsen Co. of Canada, Ltd., with A. O. Strandberg, project manager. R. E. Davis, Jr., represents the Prepakt Concrete Co. at Kemano.



HAULING SECTIONS up the steep mountain, means use of aerial tramway.

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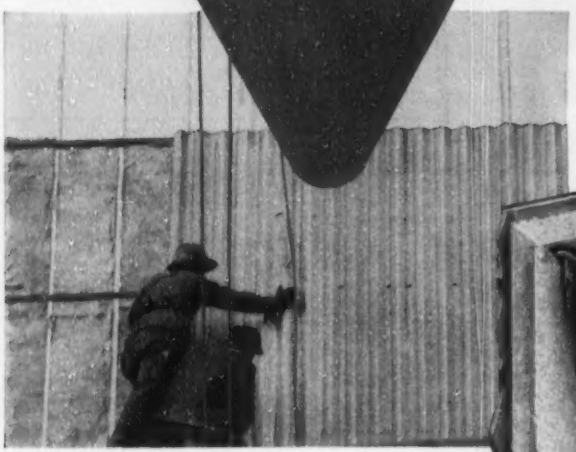

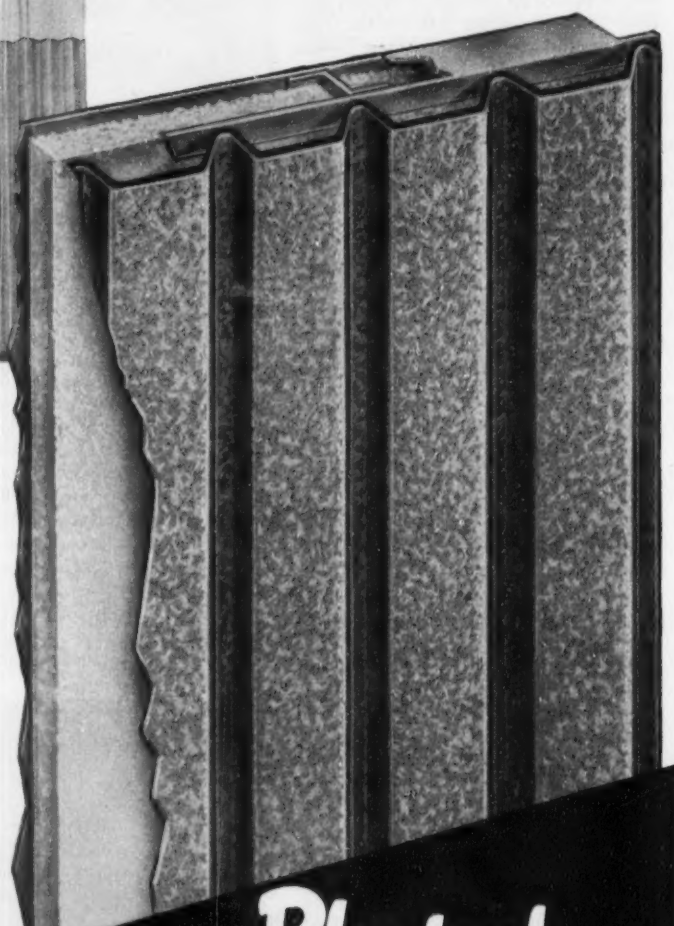

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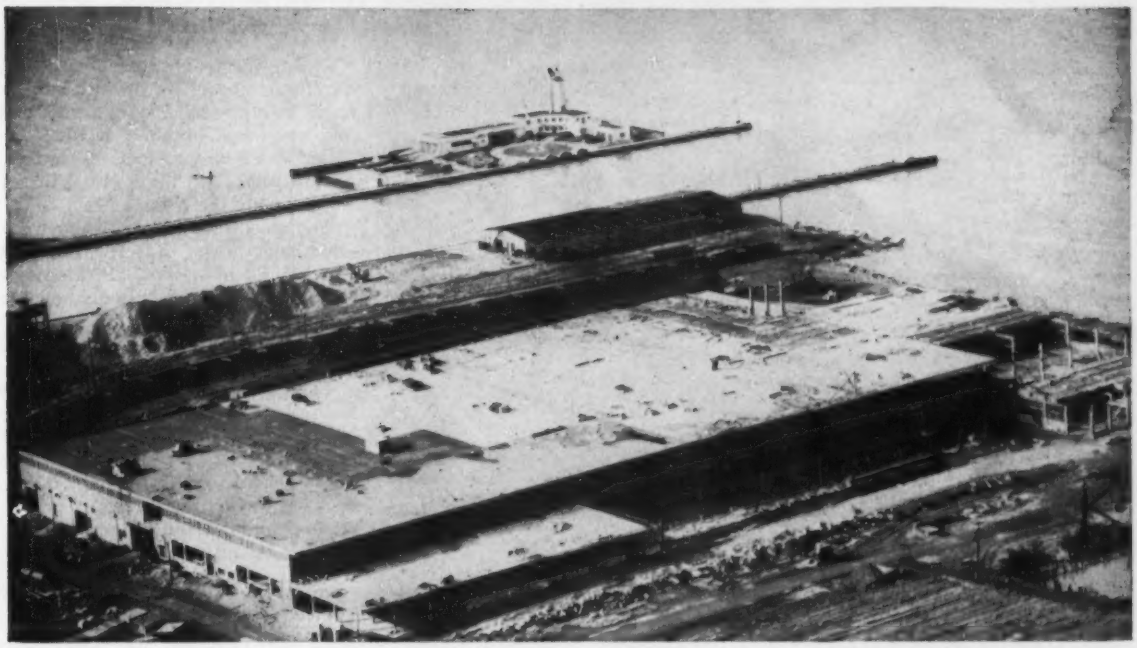


ALL HANDLING OPERATIONS of Cleveland's parcel post and bulk mail will be consolidated in a sprawling two-story terminal building to be completed this summer on the Erie lakefront. Channel is mouth of Cuyahoga River.

Rolling formwork solves speed problem

Eight sets of movable timber and pipe forms were pressed into service to beat a winter deadline, and meet the target completion date of June, 1954

Under normal conditions, first things come first in building construction: Foundations, first floor, columns, second floor, etc.

But when you must leave the first floor slab until last, it takes a bit of construction strategy to keep the job on schedule.

This was the situation facing the contractor on construction of a sprawling, two-story railway mail and parcel post terminal at the mouth of the Cuyahoga River in Cleveland, Ohio.

One answer lay in developing a system of building the second floor first and then the roof, leaving the ground floor slab to be poured last; another answer was several sets of movable, or rolling, forms that included both timber and metal-pipe types.

Part of the second floor is flat slab construction, 11 in. thick, with dropheads at the 20-in. dia columns. The remainder is heavy, reinforced concrete beam and slab construction.

• **Race against time**—From start to finish it was a race against time to get the huge building roofed and closed in as much as possible before winter weather set in. Although the contract had been awarded in the fall of 1952, design plans were not completed in time to permit starting construction of the superstructure until late spring last year.

Normally for a building of this size, the footings and ground floor would have been completed first, to give a level working area to support the forms for the second floor.

But by the time the contractor had driven the 5,800 treated timber piles and capped them, schedules necessitated construction of columns, second floor and roof ahead of the ground floor. There are nearly 500 reinforced concrete columns in the entire building, mostly circular. They were cast-in-place, in heavy laminated paper forms.

• **Lake front location**—The two-story Railway Mail and Parcel Post Building is located on West Ninth Street, just east of the junction of the Cuyahoga River and Lake Erie. Ground floor is 8 ft above the normal lake level.

The main building measures roughly 600x420-ft, plus a 375x180-ft two-story garage built onto the lakeward, or north end. The garage will furnish storage, service and maintenance facilities for 350 parcel post trucks. The main building is divided into two units. The western unit, 600x200 ft, will service bulk mail and parcel post arriving by rail. It will have facilities for loading or unloading 80 cars of mail at one time, on four sets of double tracks.

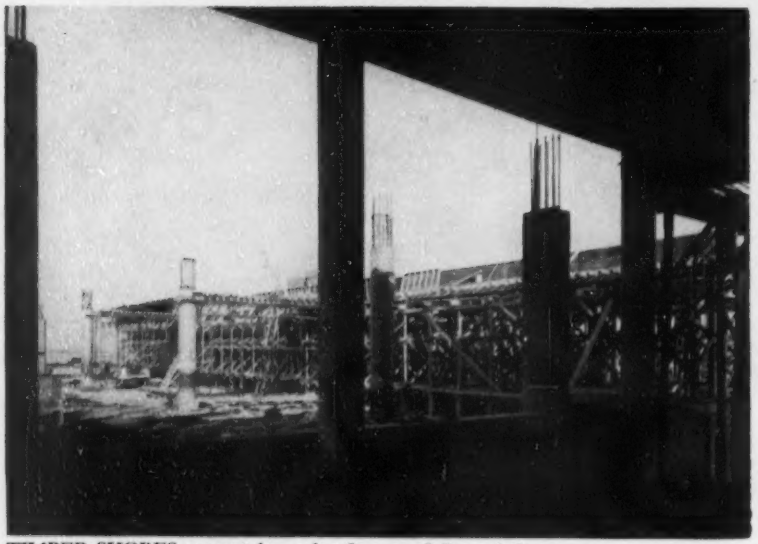
The other unit, measuring roughly 600 ft long by 220 ft wide, will handle incoming and outgoing truck mail and will contain the main offices of the building. Trucks will have access to this area at both the first and second floor levels.

Access ramps and viaducts being built as part of the over-all $8-million contract will lead down to the first floor or up to the second floor. These access structures include 500 ft of two-lane highway bridge over existing railroad tracks, 200 ft of fill, and 280 ft of reinforced concrete viaduct leading to the second floor level.

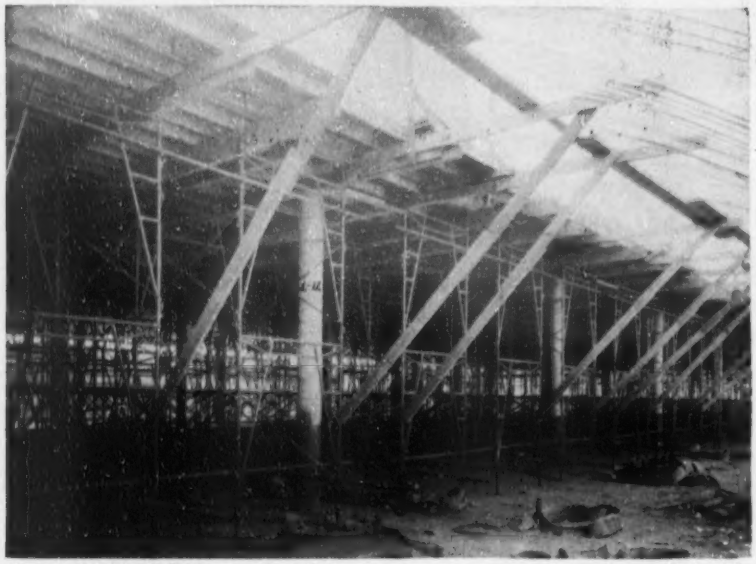
Incoming trucks will back up and unload through drop chutes in a 600-ft unloading platform extending along the east side of the building. Two underground conveyors will transfer the mail to other conveyors which will carry it up to the second floor for redistribution and storage.

Other conveyors also will carry the

(*Continued on page 34*)



TIMBER SHORES support forms for the second floor of the garage.



PIPE SCAFFOLDING was adapted to support some concrete forms, to speed the job.

bulk mail and parcel post from incoming railway cars to the second floor, or vice versa. Likewise there will be 8 hydraulic elevators between the first and second floors.

• **Foundations**—It was in January of last year that foundations were started. The 500 concrete columns are supported on a total of 5,800 treated timber piles, driven to a 25-ton resistance each. They average 50 ft in length. The piles were driven in clusters of 9 to 26 per cluster, and capped with 4.5 ft of reinforced concrete.

At the height of activity, three pile driving rigs were used. The pile caps, totaling 5,600 cu yd, were poured between Feb. 9 and July 13 of last year.

• **Timetable**—The first pour of the second floor was made on Mar. 4 and the last pour completed Nov. 3. The first pour of the roof was made last July 1 and the final pour on Dec. 9.

Between these extreme dates (May 4 and Dec. 9) the contractor formed 750,000 sq ft of slab, beams and columns and poured 24,000 cu yd of of concrete. The entire job calls for 1,032,000 sq ft of form work and 32,000 cu yd of concrete.

All concrete was delivered to the job in transit mix trucks, hoisted by bucket and crane, and deposited in place by hand-operated buggies. No quick setting cement, or air-entraining additives were used, but additional cement was used to give the required structural strength at 5 days of curing. The heavy girders were reshored with 8x8-in. posts, which remained in place 15 days.

• **Rolling forms**—Decision to use rolling forms rather than built-in-place forms to support the second floor and roof was based on three factors: Required speed of construction, shortage of carpenters, and the unusual height of forms for the second floor.

The second floor is 18 ft above finished floor grade. But the last 4 ft of select fill to support the first floor had not been put in place when the second floor was built. This meant that forms for the second floor had an overall height of 22 ft.

The contractor originally planned to use up to six sets of rolling timber falsework to construct the second floor and roof forms. Construction was started with three sets of these forms, two for the flat-slab portion of the building and one for the heavy girder-and-slab in the railway unit.

• **Pipe forms added**—Early experience indicated that a shortage of carpenters might be expected and that time would be saved and the schedule maintained by the use of lighter steel pipe supports instead of timber supports as originally planned. Therefore the three sets of timber falsework were supplemented with three sets of rolling steel supports. The latter were adapted from conventional pipe-scaffold units. As the deadline date neared, however, two more sets of steel-pipe falsework were added, since it was found the original schedule for re-use of falsework was slightly optimistic.

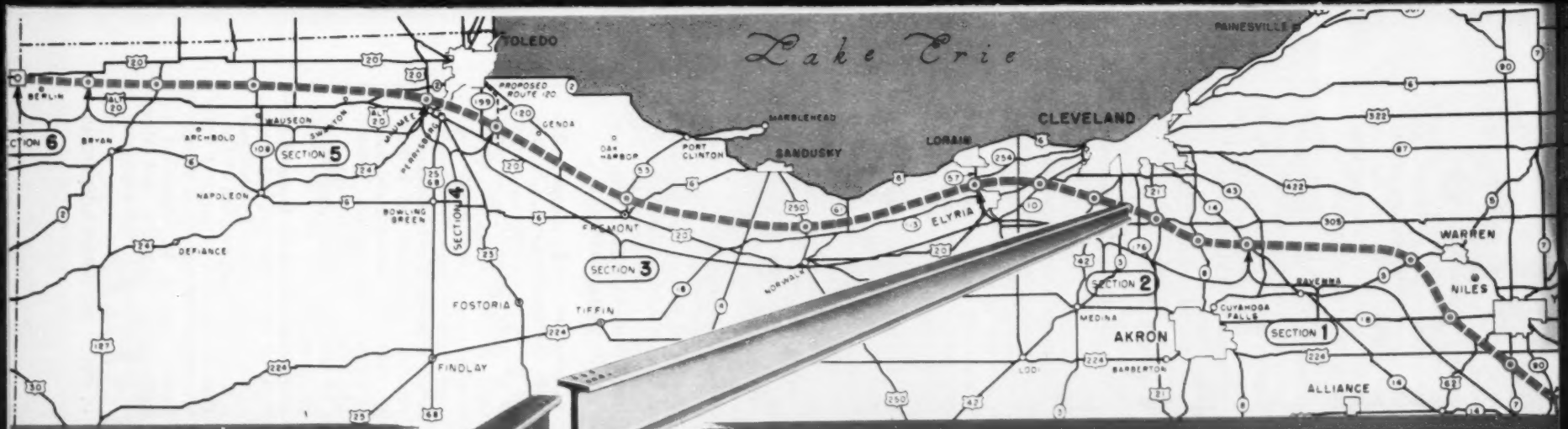
Incidentally, the decision to use the pipe supports instead of timber was amply justified. While no great economy was apparent from the use of the pipe forms (relative cost figures are not available), the contractor expressed the opinion that they helped him keep the job on schedule, and solved the carpenter problem.

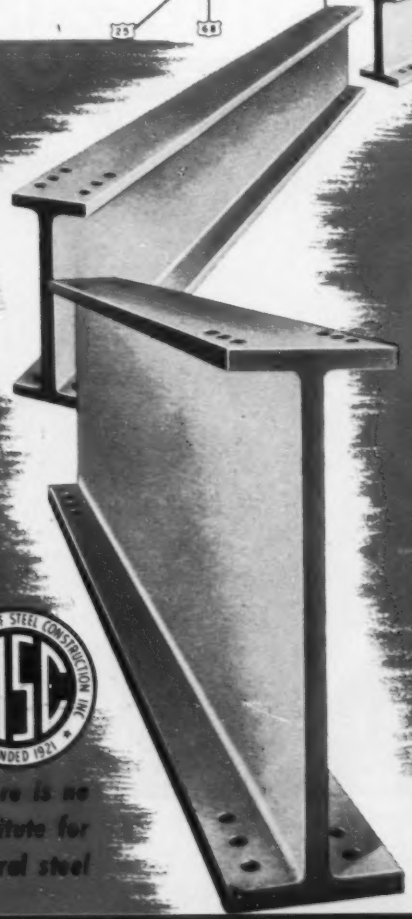
With plenty of forms on hand, the job went like clockwork. While the first set of forms was starting a pour (3 bays wide) in the flat slab portion, a second set could be put into operation several bays ahead. The same scheme was used in the railway unit and for the second floor of the garage. The cast-in-place roof was formed on the pipe frames.

• **Supported on mud sills**—Both the pipe forms and the timber forms were operated in similar fashion. When the second floor was concreted, they were supported on a system of railroad-tie mud sills. Railroad ties happened to be in abundant supply.

The timber forms were moved forward on inverted dollies, operating on steel channel tracks. They were made

(*Continued on page 36*)





Practically all of the *Bridges* required for the NEW OHIO TURNPIKE are being built with

STRUCTURAL STEEL

It is significant that structural steel,—because of its durability, flexibility and strength,—has been specified for most of the bridges required on the Ohio Turnpike. Seventy-two (72) of these bridges, of which 26 are twin type, making a total of ninety-eight (98) structures are being fabricated by FORT PITT,—an organization with over 57 years of experience in engineering, fabrication and construction of structural steel.

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TOP ECHELON CONSTRUCTION STRATEGY is mapped out by contractor F. F. Duffy (at left) and his chief engineer, H. A. Mix.

up of 4x6-in. posts, 3x10-in. stringers, 2x6-in. joists and ¾-in. plywood. The pipe forms were moved ahead on casters and raised or lowered into position with screw jacks.

Column spacing lengthwise of the building is 26 ft c-c. Transversely, it ranges from 45 ft to 52 ft in the girder-and-slab railway unit. In the remaining flat-slab portion the columns are spaced at either 24 ft or 26 ft c-c.

When the job was going at peak speed, the contractor made three pours per week, without working overtime. There were 44 pours in the second floor, 29 in the roof and 13 in the garage. Average size of pour was 325 to 350 cu yd. In the flat slab portion of the building, a normal pour covered an area 52 ft wide by 154 ft long. In the railway area a normal pour was about 26x196-ft.

• **Relieves traffic congestion**—Completion of the parcel post building not only will facilitate the movement of bulk mail through Cleveland, but it also will alleviate traffic congestion of parcel post trucks on downtown streets.

Currently, the parcel post is handled in an old wooden building of the New York Central, at the main post office, and at three other locations in downtown Cleveland. Because of its location, well outside of the business district, the new parcel post building will permit the dispatching of parcel post trucks on freeways and other arterial streets, thus avoiding considerable downtown congestion.

The two story building is entirely functional, with the accent on efficiency of operations in handling the huge volume of bulk mail and parcel post. Exterior walls are cavity-type, with concrete block, faced with 4-in. brick veneer.

The ground floor is 6 in. of concrete with ½-in. topping, supported on 4 ft of sand-clay fill. Both the precast concrete roof for the garage, and the cast-in-place concrete roof for the remainder of the building have a 20-year bonded finish of insulation and builtup roofing.

Lighting will be furnished by 3,200 fluorescent lights. Heating is supplied by forced-air hot-water units hung from the second floor and roof. Kitchen and cafeteria service will be provided for a total working force of 600 persons—on a three-shift basis.

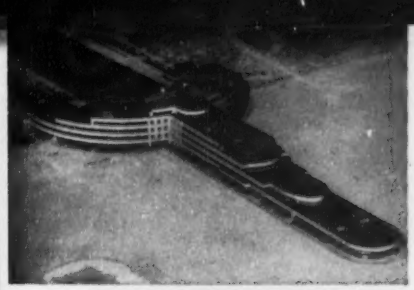
• **Noiseless inspection gallery**—An inspection gallery winding throughout the main building is supported from the second floor and roof by steel-strap hangers and U-bolts embedded in the concrete. Its walkway is 3-in. of concrete on ribbed metal lath, and topped with ¼-in. of cork to make it noiseless.

The $8-million structure, covering more than seven acres, is being built for Western Realty Corp.—a subsidiary of the New York Central Railway System, which is the owner. It will be leased to the U. S. Post Office Dept., for a 20-year period.

• **Contractors and engineers**—The Duffy Construction Corp., Cleveland, has the entire construction contract. F. F. Duffy, president, is in overall charge of the work, and H. A. Mix is chief engineer. Other Duffy supervisors include: John W. Norrgard, project manager; Michael Comer, construction superintendent; A. L. Buckler, field office manager; and L. B. Delamater, office engineer. National Engineering & Contracting Co., Cleveland, were subcontractors for the pile foundations.

Friedman, Alschuler & Sincere, Chicago, are the architects and engineers on the project. George D. Thompson is their project engineer, and William Bluedorn, resident engineer. F. H. Simpson is chief engineer of Western Realty Corp. A. M. Westenhoff is engineer of construction, and Max Nearing, Cleveland district engineer.

TOUGH FOUNDATION WORK—A total of 5,800 treated piles were driven in clusters, and to an average penetration of 50 ft, to support the 500 reinforced concrete columns of the main building and garage.



Huge Terminal Building at World's 2nd Largest Airport

By AMERICAN BRIDGE

4,000-Ton steel framework fabricated and erected for 460-ft. semi-circular 7-story Administration Bldg. and 578-ft. Loading Dock

THE new thirty-three million dollar Greater Pittsburgh Airport, opened in June 1952, is an impressive sight. Its sixteen-hundred acre airfield is the second largest in the world . . . larger even than Washington's National Airport and New York's LaGuardia Field combined!

But, as impressive as is the airfield itself, it is overshadowed by the spectacular Administration Building. This seven-story, semi-circular structure with its long loading dock is easily the world's largest terminal building.

American Bridge fabricated and erected the 4,000-ton steel framework for this huge structure which is 460′ feet in breadth at its widest point, and with its 578-ft. loading dock has an over-all length of 979 feet. Nine months after the erection crew took over, the last rivet was driven.

This huge building is another example of American Bridge engineering and fabricating "know-how". And it is your assurance that you can depend on American Bridge to handle any type of steel-frame construction with thoroughness and speed . . . any time . . . anywhere. If you would like to know more about the advantages of American Bridge fabricated and erected construction, call our nearest office.

Interesting Facts

Airfield is 2nd Largest in World.

Terminal Building is Largest in World.

The terminal building provides facilities of a small city, including a 62-room hotel, a restaurant to accommodate 3000, numerous shops.

Designed by: Allegheny County Department of Aviation.

Owner and Operator: Allegheny County Department of Aviation.

Architect: Joseph Hoover, Pittsburgh.

Consulting Engineer: L. W. Cook, Pittsburgh.

Structural Steel Fabricated and Erected by American Bridge: 4,000 Tons.

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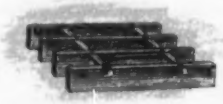

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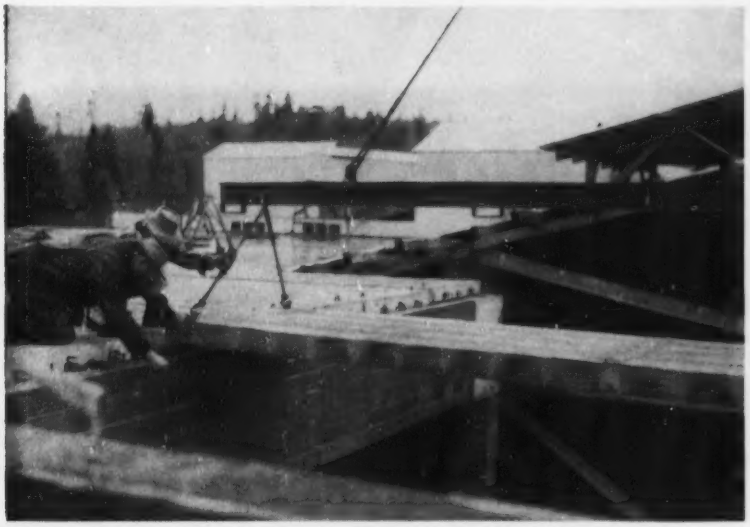


Prestressed-tile roof and girders . . .

. . . make all-tile building possible

Prefabricated units of structural clay tile form a lightweight 50x60-ft building that demonstrates possible future applications of this material. The structure was built by Builders Brick Co. at its plant near Seattle, Wash.

The roof consists of 20-ft long slabs made of tile held together by tensioned bridge strands. These are supported on 50-ft-span, prestressed girders, also made of tile, which in turn rest on reinforced tile columns.

A standard type of tile—a 12x12-in. by 6-in. deep, three-cell, load bearing unit—was used through the building. Weighing 33½ lb apiece, the tile has an average strength of 10,000 psi on the net section.

This initial application indicates the possibility of using a lighter tile, perhaps with grooves into which prestressing or reinforcing rods can fit, says Harry Powell, of Seattle, consulting engineer for Builders Brick Co.

• **Quake-resistant columns**—The tile columns, about 20 ft high, spaced 20 ft c-c in one direction, 50 ft in the other, were designed to withstand earthquakes. They are 18 in. square. Each course is composed of three tiles and a central core of concrete.

A 1¼-in. dia reinforcing bar was placed in 6-ft lengths in each of the four corner cells of a column as it was built up. These bars were joined by welding to previously positioned bars, and base units were doweled to the concrete footings. Column ties ⅜ in. in diameter were inserted in the joints between courses.

The tiles were filled with grout as the columns were built up. At the top, brick was added to some members to bring all to a uniform height. Labor requirements per column averaged 2.7 man-hours.

• **Tile girders**—Prefabricated on the site, the 50-ft girders were designed to support a total load of 70,000 lb. Exterior girders are 37 in. deep, composed of six courses of tile; interior girders are 43 in. deep, formed with seven courses. The latter members were prestressed with four 1¼-in. dia and two ⅞-in. dia high-strength steel bars, which were tensioned to about 100,000 psi.

Placed in the tile cells, the prestressing bars were tensioned with a hydraulic jack. They were anchored at girder ends by tightening a nut on the threaded bar ends against steel bearing plates. (These bars were not grouted in.) A 30-in. long section of reinforced concrete was used at each end of the girders to resist the bearing stresses, and the top course of tile was filled with 5,000-psi concrete.

Vertical dowels ⅜ in. in diameter, for anchoring roof slabs, were set in grooves in the tiles. These bars were anchored to the girders by grout placed in the center cell of each tile.

• **Prestressed deck**—The roof deck consists of thirty 5x20-ft prestressed-tile slabs, which were fabricated at the Tacoma plant of Concrete Engineering Co. These units consist of four tiles placed side by side, with a 4-in. space between them. The spaces, each of which contains three ⅛-in. dia prestressing strands, were filled with concrete.

Concrete strips 6 in. wide were placed along the ends and across the center of each slab. In each of them a ⅜-in. dia bar was placed to provide lateral reinforcing.

When the slabs were positioned atop the girders, the spaces between ends of adjoining units were grouted, embedding the dowels protruding from the girders.

Girders and roof deck were erected with a 20-ton crane and a four-man crew in four hours. No load exceeded eight tons.

Powell estimates that this prestressed-tile roof structure weighs 40% less than a comparable roof of reinforced concrete.

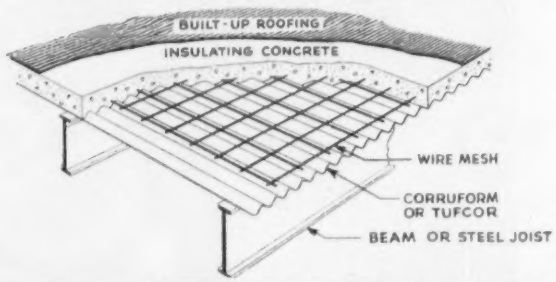
Preliminary experimental work for the building was done at the University of Washington Experiment Station by Jack Clanton, associate professor of civil engineering, and James Mueller, head of the ceramic engineering department.

Fire-resistant roofs

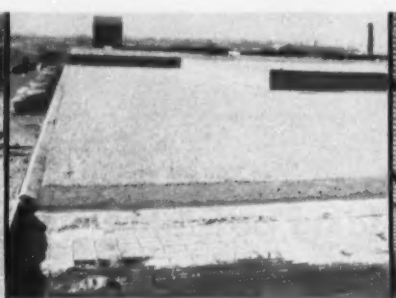
THEY'RE QUICKLY AND INEXPENSIVELY BUILT WITH TUFCOR AND CORRUFORM . . . AND YOU ENJOY ALL THE BENEFITS OF STEEL DECK

In the building of modern industrial roofs, few construction methods have enjoyed greater success than the combination of lightweight, insulating concrete slabs (wire mesh reinforced for continuity). Now Granco offers two ideal deckings for cast-in-place slabs. Tough-temper, fire-safe, corrugated steel Corruform for spans up to 4'6" and Tufcor, for spans from 4'6" to 7'. Both are far stronger than ordinary steel of the same gauge and provide roofs with fire resistance, insulating value, low dead-load, permanence and rigidity! For information, write for Engineering Data Section SFg-546, Dept. ER-D, Granco Steel Products Company.

1. STEEL SHEETS ARE QUICKLY PLACED AND SECURED by welding or by clips attached to top of joist as soon as joists and beams are erected. Positive attachment of tough-temper sheets gives added rigidity to roof framework, provides immediate working platform. Tufcor and Corruform are galvanized for permanence, give better service than ordinary painted metal deck.



2. INSULATING CONCRETE FILL IS PLACED on the deck after it has been welded to the beams and a light mesh has been rolled into position. A tight solid base is provided by Tufcor and Corruform, retaining cement paste in the slab and insuring maximum strength. Granco Vent Clips (attached to side lip of the sheet) prevent vapor pressure build-up.



3. A BUILT-UP ROOF IS APPLIED over the slab after it has been cured for 8-10 days. Rigidity of the concrete slab gives strength and long life to the roof. It can't "give" or break under ordinary traffic. Asphalt or tar can't drip through this permanent tightly joined decking and the built-up roof is protected from fire by the layer of insulating concrete.

4. RESULT: A FIRE-SAFE ROOF WITH AN ATTRACTIVE UNDERSIDE. Clean, smooth Tufcor and Corruform steel sheets may be left exposed underneath, using the bright galvanized surface for light reflection, or if desired, any normal ceiling treatment may be applied including paint, suspended plaster, sprayed-on acoustic plaster, etc.

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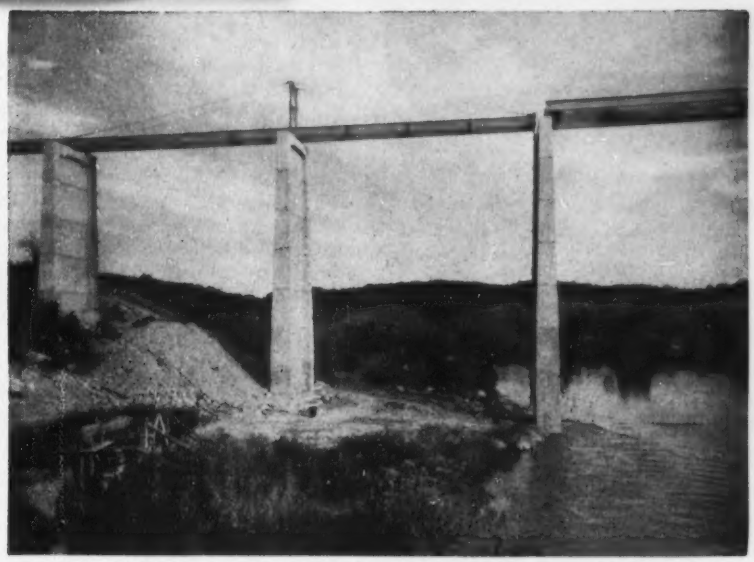


TRUSSED BEAMS approach their final position as they are rolled from high bank of South Holston River. Bridge will cross TVA's Boone Reservoir.

TVA launches bridges onto high piers

Everett Scroggie
Bridge Design Engineer
Tennessee Valley Authority
Knoxville, Tenn.

Rolling bridge spans onto their substructures is not new, but TVA developed some novel details for launching three bridges in the Boone Reservoir.

Highway relocations at the reservoir required three new bridges across the main rivers: Devault and Rainbow bridges across the South Fork of Holston River; and Pickens Bridge across the Watauga River. The profiles of the Pickens and Devault crossings were nearly identical in shape and about 100 ft in depth from the streambed to roadway grade. The profile at Rainbow Bridge was similar in shape but only about 70 ft deep.

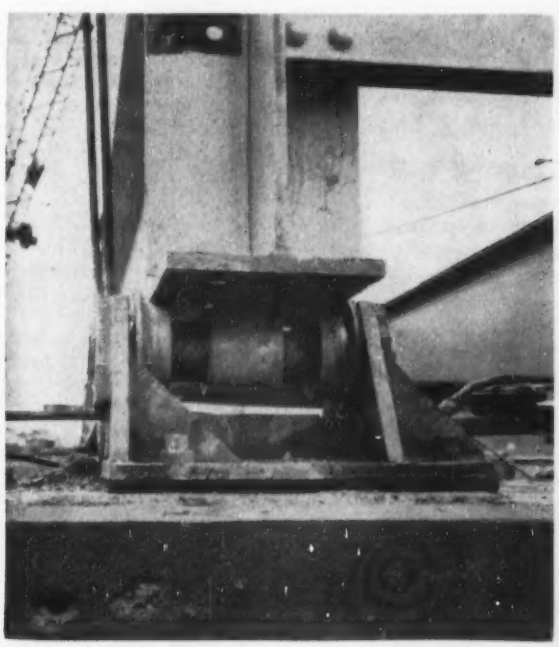
Original design investigations looked into truss, girder, and beam spans, as well as combinations of these. Beam spans were chosen. Further studies indicated that duplication of superstructures was possible and desirable. Therefore, the final span arrangement consisted of two, four-span continuous units of 76-ft 3-in. spans having four lines of 33-in. beams in each span. Channel diaphragms were provided at all bearings and at intermediate points. The deck consisted of a concrete slab with concrete curbs and parapets.

Studies were made for erecting the spans with and without falsework, which would have been not only expensive but also subject to destruction by drift. Use of a crawler crane for erection from the ground was studied, but was found impossible without the added expense of temporary bridge runways across the river channels.

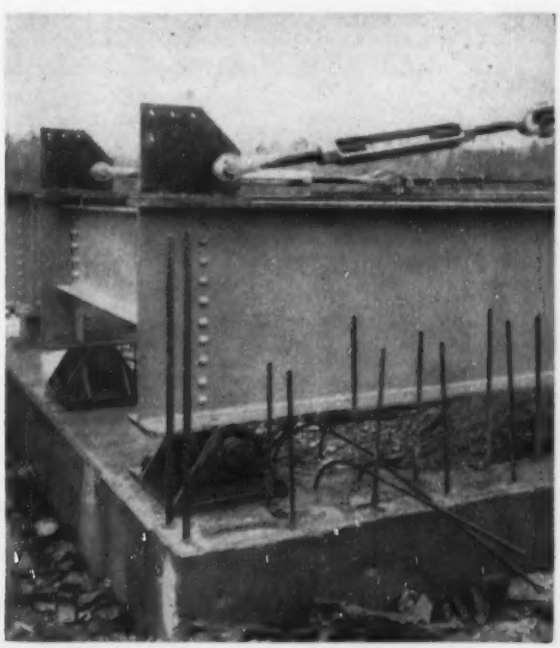
In all cases, the approach roadway was on a high embankment at one end of the bridge. Therefore it was decided to roll the spans into final position, using the embankment section as an assembly yard. This enabled obvious savings because it was possible to assemble and rivet most of the steel while on the ground.

In the field, construction of the embankment and abutment adjacent to it was stopped at the elevation of the bridge seat so that the spans could be assembled and rolled in at their theoretical grade, thus requiring a minimum amount of jacking for re-

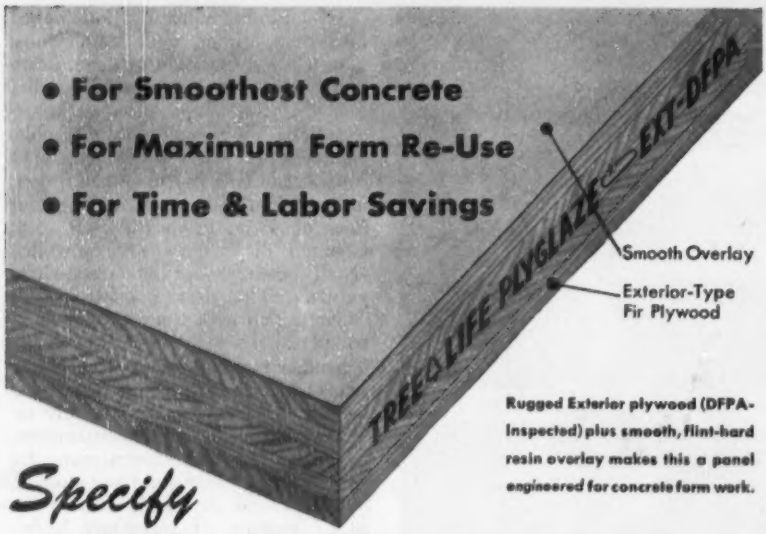
(*Continued on page 42*)



SPECIAL ROLLER on which beams were launched has flanged ends and interior grooves to pass rivets.



TEMPORARY TRUSS ropes are pinned to anchor plates at beam ends. This is abutment from which beams were launched.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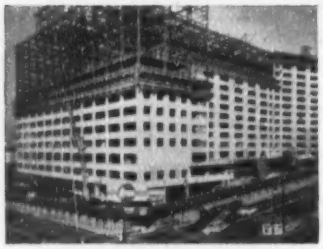

On the new Statler Hotel, Los Angeles, (above) PLYGLAZE concrete form panels averaged 15 re-uses. Huge Parklabrea apartment project, (below) required over 750,000 square feet of PLYGLAZE for ceilings and exterior walls. Concrete was so smooth that ceilings were merely painted and left exposed.

JOB AFTER JOB proves the superiority of Plyglaze for architectural concrete work. Plyglaze has the size and strength of Exterior fir plywood — plus extra-smooth, extra-tough, high-density fused resin-fiber surfaces.

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WRITE FOR DATA on **PLYGLAZE** Concrete Form Panels: St. Paul and Tacoma Lumber Company, Dept. EN, Tacoma 2, Washington.

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moval of rollers and installing permanent shoes.

Two lines of beams, or one-fourth of the bridge, were assembled for rolling in at one time. Special steel rollers were mounted on the abutment bridge seat, on piers and on concrete pads located on the embankment. The rollers were grooved to clear rivet heads on flange and splice plates, and the ends of splice and flange plates were beveled to avoid sharp bumps at the rollers. The beam splices and connecting diaphragms were riveted up complete on the ground.

A pulling yoke was connected to the front end of the 305-ft unit. Deflection of the beams was prevented by means of inverted double "hog-chain" trusses consisting of wire ropes with turnbuckles and braced struts. By eliminating deflection, workmen riding the forward end merely centered the beams laterally between guide plates, using pinch bars as each roller was reached. Thus jacking was not required until the rollers were removed for installing shoes.

The spans were cambered longitudinally for appearance. This camber curve was projected to the concrete pad locations, permitting the beams to be erected and rolled with their bearing points in correct relative position at all times.

Working one site at a time the crew first completed rolling in the four forward spans. This released those spans for deck-concrete work while the other four spans were being assembled.

The rolling operation of each two-beam unit of the four forward spans was performed in two steps. The beams were moved from the embankment to the center pier (305 ft) with the aid of a crawler crane back of the unit. A line from the crane was reeved through a snatch block at the abutment then hooked to the rear of the unit. This gave close control of movement without need for a long cable over the pier tops. The crane was used because it was available; its prime purpose was to unload and assemble the steel. The next 305 ft of rolling was done with a winch located on a truck just ahead of the forward abutment. Rolling was easy, and the total time required for moving a two-beam unit for a distance of 610 ft was only about 20 min. After placement, the only steel that remained to be erected was the shoes, center diaphragms between the pairs of beams and expansion devices.

The bridges were designed and constructed by the Tennessee Valley Authority. Construction work was under the supervision of W. B. Richardson, branch chief, and A. E. Rush, field superintendent.

FOR LASTING ROOF ECONOMY

Design with TRUSCON FERROBORD® STEELDECK

- **Longer spans between purlins**
- **Full-length interlocking**
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● Whatever the roof—flat, pitched, curved—you *save* with Truscon Ferrobord Roofdeck.

This lightweight steel decking is available in units long enough to span three or more purlin spacings. Members are designed and formed for *full-length interlocking*, giving maximum lateral distribution of concentrated loadings. Ferrobord may be considered as a continuous beam rather than as a simply supported beam, with a consequent increase of 25% in carrying capacity. Result: you save on trusses and structural work.

Truscon Ferrobord roofs large areas quickly. It is easy to handle, easy to place. Narrow width of this deck permits each piece to be fastened to its support at each rib, with individual units either welded or clipped to supporting framework. Vertical ribs with bottom flange take stress and offer perfectly flat contacts for welding. Work is done from above. No need for scaffolding or movable stages during erection.

When laid, Ferrobord's top surface presents a smooth unbroken face that is ideal for the application of insulation and built-up waterproofing. You'll find complete details on Truscon Ferrobord Steeldeck in Sweet's; write us for literature describing all Truscon Steel Building Products.

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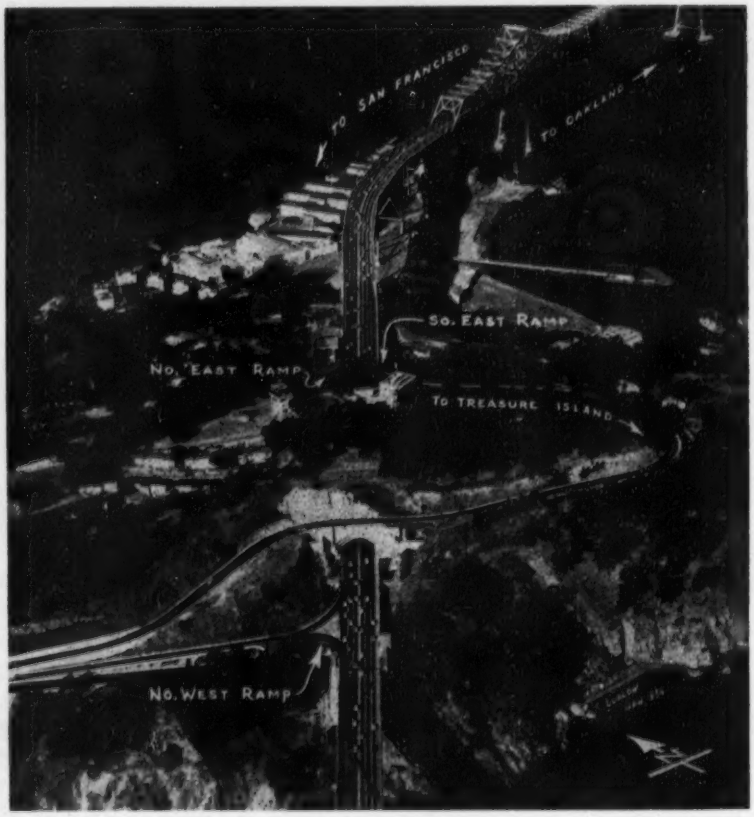


NEW LOOK on the Yerba Buena Island interchange system will feature alteration of four connections to allow merging of island bound traffic at road speeds.

Face-lifting will speed bay traffic

Work begins on ramp revision, lane control signals and new toll facilities on Oakland Bay Bridge

Costing $4 million, improvements designed to alleviate congestion, increase safety and speed up collection of tolls are planned on the San Francisco-Oakland Bay Bridge in the next few months. (ENR March 18, p. 28).

The work, it was announced by state Director of Public Works Frank B. Durkee, will be financed out of bonds already issued by the California Toll Bridge Authority.

Improvements will be divided into five projects: Revision of four connections to Yerba Buena and Treasure islands; lane control signals on the lower deck; dredging and drainage structures for the widening of the toll plaza and its approaches north of the administration building and to provide for extension of the overhead structure carrying traffic to and from the port of Oakland; surfacing of new toll lanes and alteration of the port of Oakland overhead and the revision of the existing toll lanes south of the administration building to provide for driver's side only collections.

• **Connections**—Autos entering Yerba Buena Island from the upper deck of the bridge must now slow down almost to a stop to make the right angle turn. The new connections will permit island bound cars to pull out of the main stream of bridge traffic and make their turns at normal speed.

Cars entering the bridge from the island will be able to merge into the traffic stream by means of an acceleration lane instead of having to enter at a right angle and from a full stop.

On the lower deck, trucks and buses turning from the bridge onto the island will no longer have to swing wide,

as they do at present, to avoid columns and other obstructions. These obstacles will be removed and the entrance widened.

• **Signals**—The traffic signal system for the three-lane lower deck will expedite the flow of traffic by providing two lanes in one direction whenever called for by emergencies or periods of temporary congestion.

The installation will consist of signal heads placed at about 600-ft intervals above each traffic lane the entire length of the lower deck. It is believed this system will be the longest and most complete of its kind in the world, Public Works Director Durkee stated.

An operator seated at a master switch panel in the administration building can change the signals at any time to conform to traffic conditions on on any part of the lower deck, including emergency conditions as radioed or telephoned in by patrolman or maintenance workers.

Durkee said the signal system of lane control, by providing maximum flexibility in the routing of traffic, would also prove valuable in the event of any conditions making it necessary to use the lower deck for traffic—normally, lower level is commercial. During the Key System strike of 1953, when the lower deck was used by passenger cars during peak periods, the adjustment of lane assignments had to be handled manually by bridge employes, placing and shifting portable signs and dividers.

• **Fast toll collections**—The widening of the toll plaza and its approaches to provide for 10 additional toll gates not only will serve to expedite traffic flow across the bridge but also will tie in with East Bay highway improvements and with the North Harbor development contemplated by the port of Oakland. The design of the project allows access to any future harbor improvements north of the bridge approach.

The roadway widening will extend from the East Bay distribution structure to and beyond the toll plaza. Expansion and widening of the distribution structure and the Eastshore Freeway north from Oakland are now under contract.

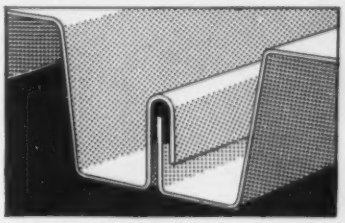
The port of Oakland overhead will be reconstructed and extended to span the widened highway east of the toll plaza.

When the new toll lanes have been completed and the existing lanes re-

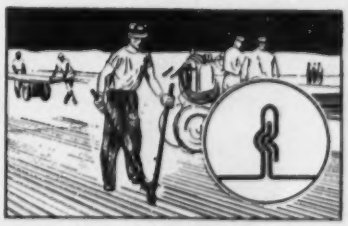
(*Continued on page 48*)

Quickly erected Q-Deck helps lower roof fire hazard

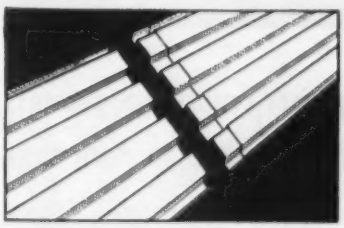
The many unique features of Robertson Q-Deck make it of special interest to the architect and engineer who is concerned about the fire hazard aspect of his flat roof design. To begin with, Robertson Q-Deck is designed with tight side and end laps to eliminate the need for an inflammable vapor seal. Its two-foot width and long span characteristics mean fewer joints, and its zinc-coated surface (or basic Galbestos) eliminates the need for field painting.



Robertson Q-Deck side laps are designed to form a standing seam. A seal in the form of a continuous caulking material assures a vapor-tight joint.



A special Robertson clamping tool mechanically fastens the side laps together, forming a steel fire barrier that remains intact as long as the structural supports are in place.



Ends of Robertson Q-Deck are sized and countersunk to produce a tight, smooth, two-inch lap joint. This lap, along with the tight side laps, provides a vapor-sealed roof construction.

Excessive amounts of asphalt are eliminated on Robertson Q-Deck because the adhesive is applied to the *insulation . . . not to the steel deck.* This also results in a better bond between the steel and the insulation.

Robertson

Q-DECK

a product of **H. H. Robertson Company**

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You get the extra reserves of power you want and need—power for moving big loads quickly and efficiently . . . greatly increased acceleration and hill-climbing ability. The mighty, all-new "Jobmaster 261" engine* is the most powerful Chevrolet truck engine ever built. And it brings you increased operating economy along with time-saving performance.

GREATER CHASSIS STRENGTH

You save on maintenance because these great new Chevrolet trucks are built stronger for longer, lower-cost life. There are higher-capacity clutches, stronger rear axles and more rigid frames in all heavy-duty models.

See your Chevrolet dealer soon for all the money-saving facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

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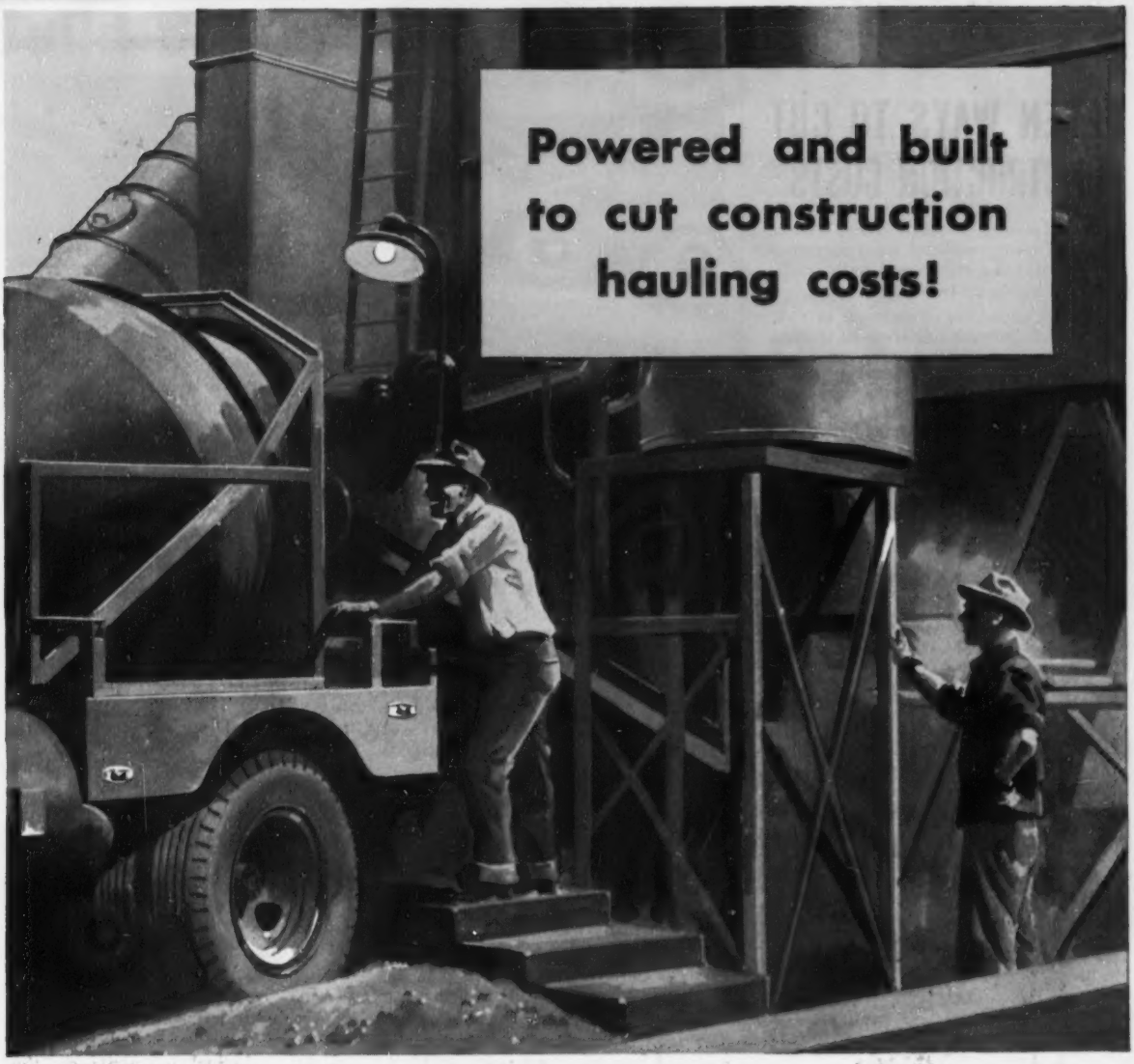
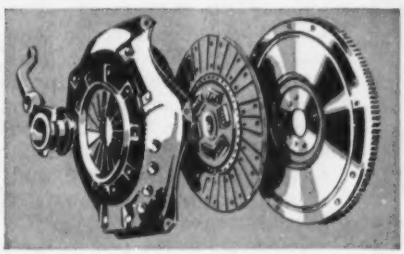


New Ride Control Seat*

Seat cushion and back move as a unit to absorb shocks and prevent annoying back-rubbing on or off the road! It's the last word in driver comfort.



Higher-capacity clutch

New design assures positive, full-pressure engagement. Larger facing area in the heavy-duty models provides higher capacity and longer life.

MOST TRUSTWORTHY TRUCKS ON ANY JOB!

Plus all these Advance-Design truck features: **THREE GREAT ENGINES**—The new "Jobmaster 261" engine* for extra-heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **HEAVY-DUTY SYNCHRO-MESH TRANSMISSION—DIAPHRAGM SPRING CLUTCH—HYPOID REAR AXLE—TWIN-ACTION REAR WHEEL BRAKES** on heavy-duty models. **DUAL-SHOE PARKING BRAKE** on heavy-duty models. **NEW RIDE-CONTROL SEAT*—NEW, ROOMIER PICKUP, STAKE AND PLATFORM BODIES—NEW COMFORTMASTER CAB—PANORAMIC WINDSHIELD—BALL GEAR STEERING—NEW ADVANCE-DESIGN STYLING.**

**Optional at extra cost. Ride Control Seat is available on all cab models, "Jobmaster 261" engine on 2-ton models.*

By proper use of welded design, steel and manhours can be reduced 15% in erection of buildings and bridges

SEVEN WAYS TO CUT CONSTRUCTION COSTS*

The following savings are a direct result of using welded steel in structural design as compared with traditional riveting or bolting:

1. Weight reduction of as much as 15% is realized since the full areas of tension members and tension flanges are effective. Members subject to bending may be designed to take full advantage of continuity. Gusset plates, splice plates and connections are materially reduced . . . often completely eliminated. Height of building is usually reduced since floor beams are of less depth.

2. Fabricating time and cost is less because layout, punching and drilling of holes is eliminated.

3. Size and cost of foundations is lower where safe bearing power of soil is low.

4. Greater freedom in design is possible. Structures can be made fully continuous to provide against forces of hurricanes, earthquakes and atomic blasts. Additions and alterations to existing structures are easier.

5. Design time is less because welded designs take fewer details, involve fewer pieces.

6. Maintenance costs are lower. Smooth surfaces on welded connections mean less corrosion, less painting.

7. Noise of erection is eliminated . . . an important factor in areas near hospitals and office buildings.

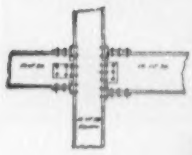


Fig. 1. Typical Riveted Connection *of floor beam to column. Auxiliary steel required: 53 rivets (⅞"); 4 pieces 18" I beam; 2 pieces 6" x 4" angles; 2 pieces 4" x 3½" angles.*

Fig. 2. Typical Welded Construction *of floor beam to column. Auxiliary steel . . . only 3.2 pounds welding rod; 4 erection clips.*

*Condensed from paper by Fred L. Plummer, Director of Engineering, Hammond Iron Works, Warren, Pa., published in Proceedings of the Second Illinois Structural Engineering Conference.

HOW TO DESIGN FOR LOW COST

Lincoln Studies in Structural Arc Welding present latest construction ideas for efficient low cost design. Available by writing on your letterhead to The Lincoln Electric Company, Cleveland 17, Ohio.

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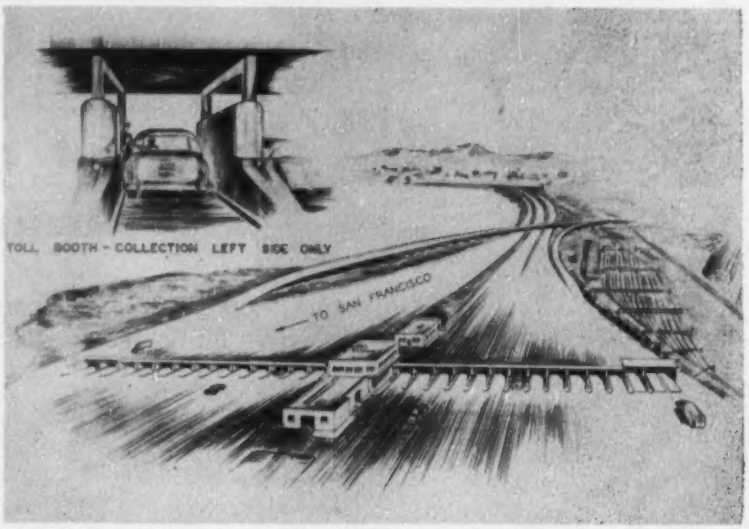


TEN NEW TOLL BOOTHS will be added to existing facilities to provide 15 eastbound and fifteen westbound booths. Drive-side collections will speed toll service.

vised, all drivers bound for San Francisco will pay their tolls at one of 15 booths north of the administration building and all eastbound drivers will pay at one of 15 booths south of the building. Collection will be from the driver's side only. Experience has shown that "on side" collection is more efficient and is preferred by bridge patrons.

Kansas City hits at congestion

A $40-million plan involving 20 miles of expressways has been scheduled definitely for construction in metropolitan Kansas City within the next ten years, according to city officials in a recent announcement.

Among the planned projects are links to and through the downtown area with U. S. Highway 40 from the east and freeway access north to U. S. Highways 69, 71 and 169.

• **Some under construction**—Another major project will be a connection with a $12-million Sixth Street expressway, already under construction (Demolition of more than 90 buildings on the north side of the downtown district already has been completed) and the existing Southwest highway, completed three years ago.

Important in the plan is the $18-million Paseo Bridge across the Missouri River, on which considerable steel is in place and which is scheduled for dedication July 4. This toll structure will carry the north-access freeway traffic.

The 20-mile system, as announced, includes a 12-block stretch of the Southwest trafficway already in place.

It also includes about three miles of highway, now under construction, north of the Paseo Bridge.

Chief new element of the plan is the Southeast Expressway connecting U. S. highway 40 on the east with the Paseo Bridge.

City officials have placed an indefinite completion period of from 10 to 12 years on the completed program, fearing that tolls on the new bridge may not be sufficient at first to meet interest and principal payments on the revenue bonds issued for the bridge project.

• **State pledges aid**—The Missouri highway department is pledged to meet any deficiency up to $800,000 a year on the Paseo structure. Should any of this money have to be paid, the city's share of state highway funds would be lessened by the amount paid and completion of the overall system would be delayed.

The state highway commission has pledged $200,000 a year for six years to underwrite another toll facility over the Missouri River connecting the city proper with its municipal air terminal and U. S. route 71 to the north.

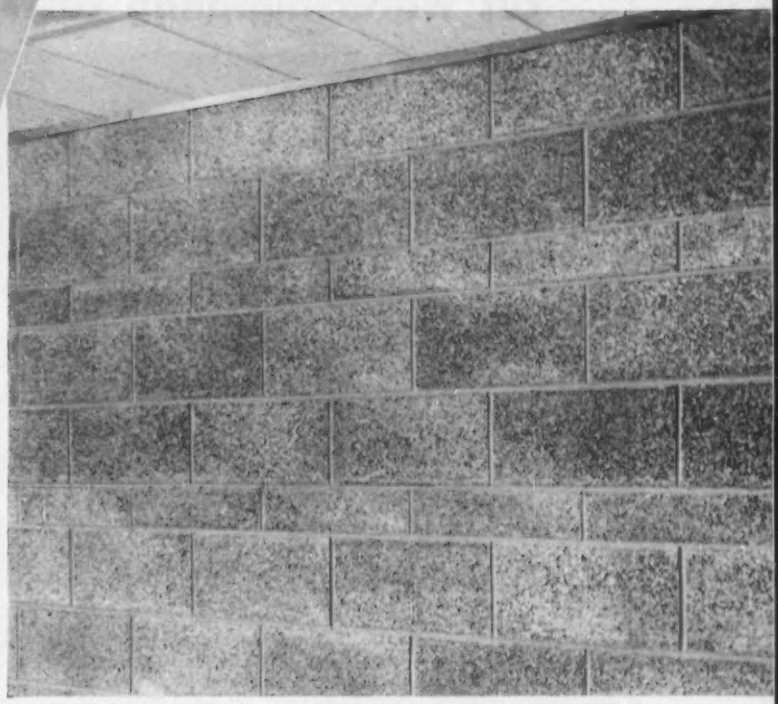
The pledge cleared the way for financing of the $11.4-million bridge. Officials are working for a summer construction start.

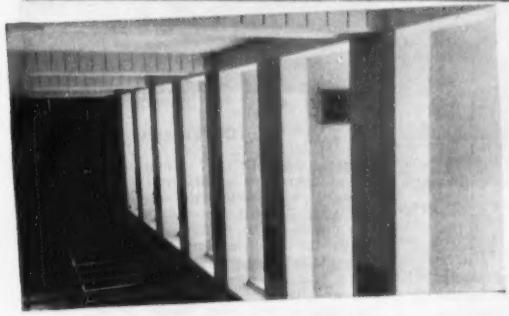
Costs of the expressway projects will

(*Continued on page 51*)

Build Better with VIBRAPAC Block

Detail in the office of a well-known manufacturing plant — Vibrapac Block — 2 course 8" high and 1 course 4" high. (Unretouched photo)





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Coordination of exterior and interior design are assured with VIBRAPAC Block . . . plus light structural load advantages, ruggedness, firesafety, superior insulation values and minimum maintenance cost. See your nearest VIBRAPAC Block Producer . . . or write to

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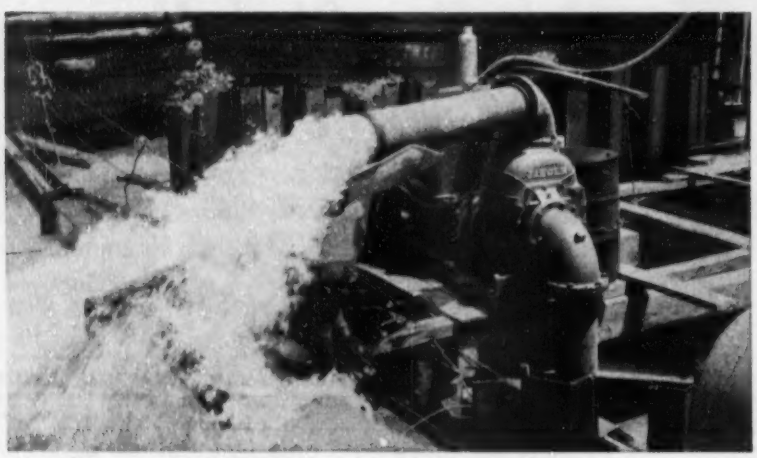
Hi-performance Jaeger pumps cut water-handling costs

New Model 2PN moves all the water a 2" hose can handle

This latest Jaeger 2" pump delivers its rated 10,000 gph when operating at only 2400 to 2550 rpm (as much as 400 rpm slower than similar pumps). It will actually pump all the water that can be pulled through a 2" suction line under average pumping conditions. You'll find it conservatively rated, even at heads well above 100 ft. Weighs only 190 lbs. including big pneumatic tires, measures only 24" x 21" x 26" high, yet it's built for heavy duty service with 20% steel shell, reversible liner plate, long-life Jaeger Lubri-Seal on shaft, impeller adjustable for wear and powerful Wisconsin AKN engine of 5.3 hp at 2500 rpm.

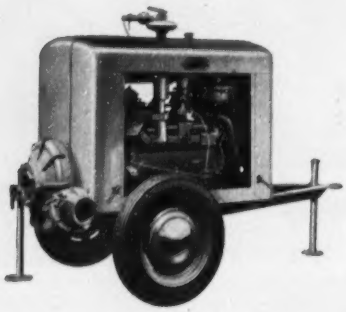


Pumping 4,000 gpm with low-cost diesel power

Because they develop their full rated volume at low operating speeds, big Jaeger pumps are ideally suited for diesel operation on big cofferdam and well point work. The Jaeger Model 10PD above is pumping 4000 gpm at 1500 rpm. This high efficiency at fuel-saving, engine-saving speeds is an exclusive characteristic of Jaeger "Sure-Prime" pumps. It requires larger shells and impellers but pays off in performance. Jaegers prime without engine-racing, don't vapor-lock on hard pulls, consume less fuel and average thousands of hours longer service than pumps that must run at higher speeds.

Latest type jetting pumps in 3", 4", 5", 6" sizes

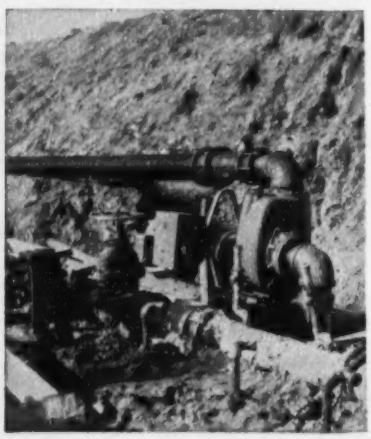
For a wide range of volumes, and pressures up to 275 psi, Jaeger has developed the most modern type of high pressure pumps . . . self-priming at the rate of 1 second per foot of lift, equipped with enclosed impellers, labyrinth sealing rings, positively lubricated shaft seals, automatic spring-actuated check valves, heat-resisting stellite-valved engines:



Model 3CPH delivers 420 gpm at 40 lbs., 125 gpm at 130 lbs., with air-cooled Wisconsin VF-4 (25 hp @ 2400 rpm).

Model 4CPH delivers 700 gpm at 75 lbs., 325 gpm at 200 lbs., with 6 cylinder engine of 218 cu. in. displacement (80 hp @ 2500 rpm).

Model 5CPH delivers 825 gpm at 80 lbs., 200 gpm at 250 lbs., with 6 cylinder engine of 236 cu. in. displacement. (95 hp @ 2600 rpm).



1½" to 10" Electric Pumps

Jaeger "Sure Prime" pumps with electric motor drive are available for all types of dewatering, including the operation of Jaeger Well Point Systems. The characteristic low speed (1150 rpm) operation of Jaeger 6" to 10" electric pumps results in much longer life. Jaeger's oversize shells, holding more priming water, also prevent overheating and vapor-lock even when exhausting the longest well point header lines.

For engineering service on pumping problems, or specific information about any Jaeger pumps, see your Jaeger distributor or write. For file data, request Catalog P-4.

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be shared on a 50-50 basis by the city and the federal Bureau of Public Roads, and the bureau and the state will share actual roadway construction costs.

Can cities condemn land? Connecticut court says yes

Constitutionality of the Connecticut Redevelopment Law was upheld recently by the state's supreme court. Challenged by a Hartford realty firm that questioned validity of granting the condemnation right to municipal redevelopment agencies in regard to privately owned property, there was some concern as to whether the law, approved by the General Assembly would stand.

The court ruled that the assembly had acted constitutionally in granting communities authority to rebuild their slum areas.

Redevelopment in eleven other Connecticut cities (each with its own agency) would have been affected by an adverse decision.

The law, as set up, permits local agencies to purchase buildings in slum areas and have them demolished for replacement by structures raised by private builders on the land sold or leased to them after necessary street improvements and utility installations have been made.

Hotel-recreation provided in 60-acre "office city"

Claiming that it is the first such project in the country, a father and son team of developers has launched plans for an "office city" in Whitehall, a suburb of Columbus, Ohio.

Don M. Casto, Sr. and Don, Jr., who pioneered shopping center development in the region, have purchased a 60-acre tract on which they will build an integrated community of one- and two-story office buildings with parking facilities for employes, and clients provided adjacent to each building.

The development will include hotel accommodations, large restaurant and banquet rooms, private luncheon rooms and catering service for all tenants. An outdoor recreation center will have tennis courts, a swimming pool and other facilities.

Its accessibility to all parts of the city, and its proximity to a shopping center and the Columbus Country Club make the location ideal, according to the Castos.

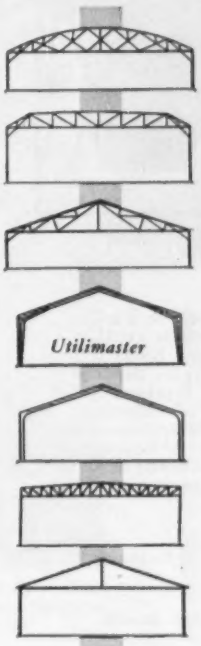
The organization believes that it can build this type of office com-

(Continued on page 52)

When you think of building... call the IDECO building consultant

When there's a building job coming up . . . industrial or commercial . . . it's the smart contractor or owner who wants to know how Ideco can fit in.

For many structures, particularly those with special requirements . . . a predesigned Ideco steel building, custom-planned, may well provide the economical and permanent solution. Designed for fast low-cost erection, Ideco buildings are available in a wide variety of sizes and styles . . . can be readily expanded, or joined to existing structures, or even moved . . . are ready for use as a factory or warehouse, yet are adaptable *inside and out* to the creation of the finest offices, show-rooms, or store. All this Ideco flexibility is yours at a most reasonable cost per square foot.



When your plans call for fabricated structural steel, used in combination with other building materials . . . Ideco shop-fabricated trusses, columns, purlins and girts can speed your job, save you money.

If a standard "package" type structure will suit your requirements, Ideco's new "Utilimaster" is your answer. Available in 40', 50', 60' clear spans . . . a typical 50' x 100' "Utilimaster" can be erected in only 10 working days, with delivery to your site in 30 days. The "Utilimaster" tapered roof beam gives maximum strength with no interference from overhead beams or supporting columns. Investigate "Utilimaster" . . . the truly economical "package" building by Ideco.*

Whatever the building project . . . industrial or commercial . . . your Ideco Building Consultant is equipped to give you valuable help. Whatever the structure . . . all steel, or steel in combination with other building materials . . . let your Ideco Building Consultant show you how accurate, shop-fabricated parts go up easily, quickly . . . save time and money.

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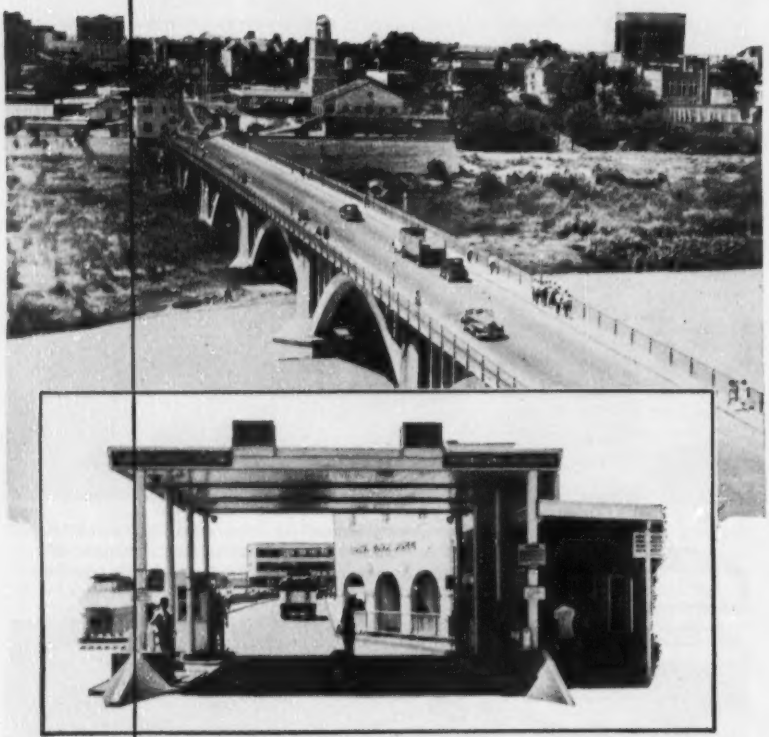
☐ *Please send your book "Steel Buildings"*
☐ *Send full details on the new "Utilimaster"*
☐ *Send name of nearest Ideco Building Consultant*

I am considering a building about _____ *ft.* x _____ *ft.*

to be used as _____

My name, position, company, address are written in the margin.

TALLER & COOPER
meets every toll need where Texas meets Mexico



The Laredo Bridge, joining Texas and Mexico, praises the efficiency of Taller & Cooper Toll Collection Equipment.

From Mexico to Canada, from Atlantic to Pacific, Taller & Cooper toll installations provide swift, reliable control of traffic and revenue. Every major toll facility in the United States depends on Taller & Cooper Toll Collection Equipment for accuracy, dependability, and speed of collection. T & C all-steel, weather-proof, Booths and Canopies, can be installed on the site in a matter of hours. They are designed to meet the specific needs of each installation, assuring every working convenience and protection.

Give the facility you are planning on modernizing the advantage of Taller & Cooper Tool Collection Equipment.

Write today for design and construction details.

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TOLL COLLECTION SYSTEMS

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munity to rent at less than half the price per sq ft in the multiple-story office buildings.

$10.5-million industry site seen for Chesapeake Bay

Application has been filed with the district engineer, Corps of Engineers, for the construction of a $10.5-million seaport facility on the middle eastern shore of Chesapeake Bay, between McDaniel and Wittman, Md.

The plan calls for dredging 20 million cu yd of solids from the adjacent bay bed and depositing it behind a concrete bulkhead about a half mile from the shore.

Concrete docks 800 ft long will be built out from the bulkhead area into 40 ft of water. The filled-in area behind the bulkhead will form approximately 400 acres of new land.

Sponsors of the project say it calls for industrialization of Delmarva Peninsula, with industries attracted by the port's bid for world-wide trade.

Cost of the project, to be financed by private industry, is estimated at $7.5 million for dredging and bulkheading, and about $3 million for the construction of dock facilities.

Redevelopment law upheld

By refusing to review a lower court decision upholding the validity of the California redevelopment law (ENR, July 16, 1953, p 70), the state Supreme Court has cleared away the last apparent barrier to San Francisco's redevelopment program.

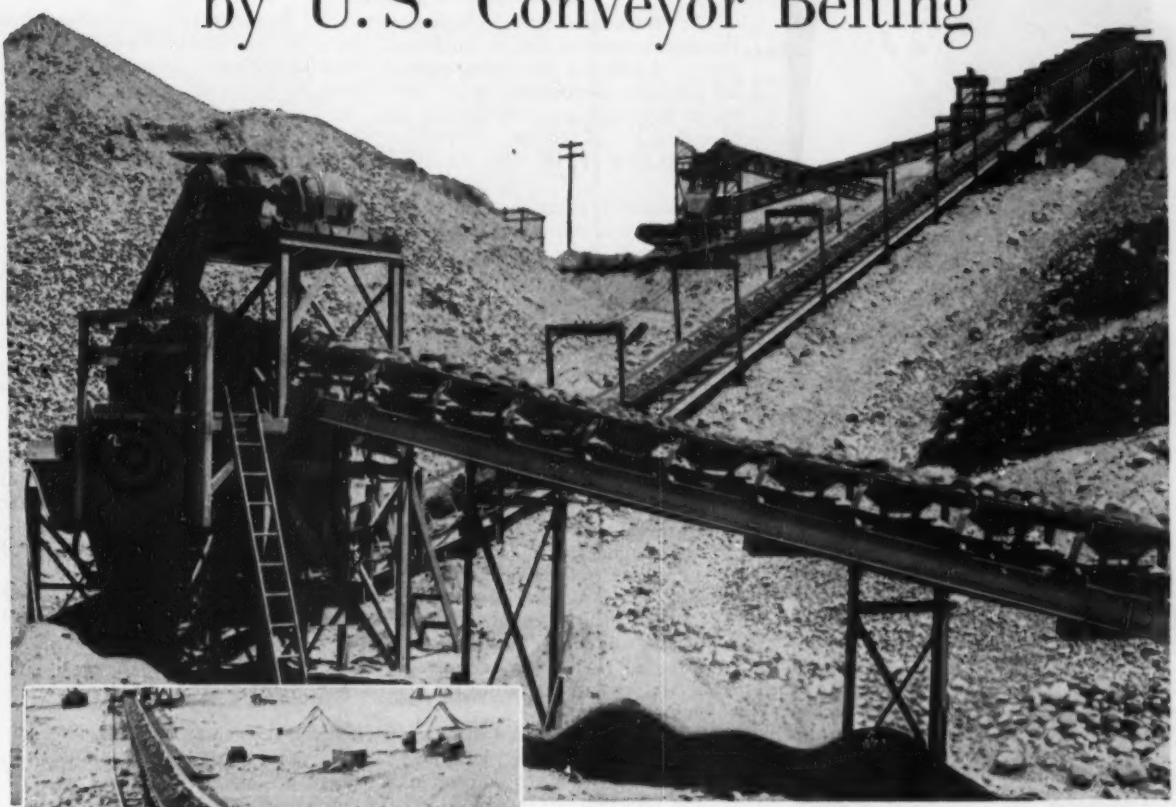
In January, a ruling of a state district court of appeals upheld the constitutionality of the law. Then J. Joseph Hayes, redevelopment agency chairman, and the Diamond Heights Property Owners Association asked for a rehearing.

The case, started as a friendly suit, was forced into serious court action by Hayes' refusal to sign, as chairman of the agency, a contract that would give the agency federal loans and grants for the program. Other agency members than sued for a writ of mandate to compel him to sign.

After the district court gave the agency the "go ahead", the DHPOA, opposed to redevelopment, intervened in the case. They contended that the Diamond Heights area, one of the first scheduled for redevelopment, is not "blighted."

The agency needs only federal allocation of money to start its real estate acquisitions for the Diamond Heights and Western Addition projects.

The roughest haulage for the Chief Joseph Dam is handled by "U. S." Conveyor Belting



Note large and jagged aggregate on "U. S." Belt at Chief Joseph Dam. The belt starts the material from the pit to the rock plant. Upper photo shows another view.

"U. S." Research perfects it.
"U. S." Production builds it.
U. S. Industry depends on it.

The Chief Joseph Dam in the State of Washington will have the world's largest single unit powerhouse under one roof. In generating capacity, it ranks second only to Grand Coulee. Nearly 2 million cubic yards of concrete are going into the Dam's construction.

The raw aggregate ranges from fine sand to extraordinarily heavy boulders as large as 20" in diameter. The rock breaks clean, leaving sharp edges which are good for concrete interlock but very bad for ordinary conveyor belting. To handle this most critical portion of the haulage, United States Rubber Company conveyor belts were selected. Although now in their fourth construction season, the belts are still going strong, and have given *no difficulties or maintenance problems.* This is another example of U.S. Rubber's *Three-Way Engineering* in which "U.S." Belt engineers worked with the designers of the conveyor system and the engineers of the dam—to make sure of obtaining the *right* belt.

The latest pioneering development of "U.S." Belt engineers is the Nyton breaker strip. The nylon used in this breaker adds flexibility and greater resistance to impact.

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INTERNATIONAL

Power commission is blamed in report on landslide destruction of power plant

The three-man British Columbia Power Commission and its chief engineer have resigned after being blamed for failing to prevent two major slides which last August nearly buried the $6-million, 25,000-kw Whatshan power project (ENR Nov. 12, 1953, p. 60).

The report holding the commission responsible was submitted last month to the British Columbia legislature by Justice J. V. Clyne, a one-man royal commission set up by B. C.'s Premier Bennett to investigate the disaster.

Commission members who resigned were Chairman S. R. Weston, W. W. Foster and Forrest L. Shaw. Chief engineer was Alfred W. Lash.

Justice Clyne found that the old commission had been complacent, despite repeated warnings of danger. He recorded that for 18 months they had been receiving reports of seepage and earth movements at the government-owned project, but failed to take effective steps.

The slides which caused "hundreds of thousands of dollars" worth of damage, resulted from water seeping out of the tunnel and saturating the soil, which finally gave way.

"I am not too concerned with trying to find out why the tunnel leaked," he said, "but with the fact that when it did leak no action was taken."

He declared that when trouble was first discovered, the plant should have been shut down, the leaks found and filled.

• **Exonerates consultants** – Justice Clyne cleared H. G. Acres & Co., engineering consultants, Niagara Falls, Ont., of any blame. "I do not think it was incumbent upon Acres & Co. within the terms of their retainer," he said, "to advise upon the self-evident facts that tunnels may leak and that saturated slopes may slip. But even if they were, such lack did not contribute to the disaster."

In his summing up, Justice Clyne said:

"The commission is charged by statute with the duty of operating any property owned and controlled by it. The members cannot escape that responsibility by saying that they employed competent assistants when they had personal knowledge of a dangerous situation which confronted them and continued to confront them for practically two years."

"If they consider they were acting in a capacity similar to that of directors of a company, then it was their duty to direct those in charge and at least they should have shown some interest in seeing what was done to avert the possibility of a danger which had been brought forcibly to their attention."

"Notwithstanding any confidence they may have had in Mr. Lash they had the responsibility of seeing to it that he carried out his duties, which he clearly did not do, either because he failed to apprehend a danger which he should have recognized, or because he was kept too busy by other tasks imposed upon him by the commission."

"Possibly similar errors can be made in cases of private ownership, but when men are trusted with public funds and with the operation of public works unfortunately they are exposed to public criticism if they err."

Regarding Mr. Lash, Justice Clyne said: "It is with utmost reluctance I

(*Continued on page 56*)

Smoke stack with bistro

Perched at the top of a factory smoke stack in Germany is a small cocktail lounge offering an unobstructed view of the plant and the town around it. An elevator in the stack takes the patrons up from ground level. Smoke doesn't bother the tipplers since it rises in a flue running through the lounge and terminating on the roof.

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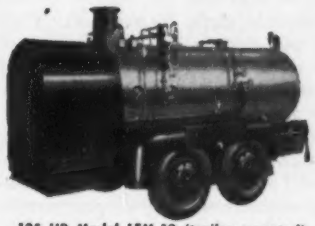


125 HP Model LFM-12 (trailer mounted)

MOBILE — PORTABLE

Portable steam for Asphalt, Ready or Hot-Mix Plants, Rock Asphalt Heating, Aggregate Drying Storage & Tank-Car Heating, Pile Driving, Winter Concrete Curing. Trailer-mounted for easy towing. Skid-mounted for installation on your truck or trailer. A.S.M.E. Code constructed. All-season usefulness, all-weather protected.

SPECIFICATIONS

MODEL	LFM-8	LFM-12
Approx. Boiler horsepower	80	125
Approx. rated capacity lbs. of steam per hour (212° F)	2760	4300
Weight of normal water capacity lbs.	3770	4860
Capacity of Fuel Oil Tank, gals.	85	115
Capacity of Gasoline Tank, gals.	5	30
SKID MOUNTED		
Overall length	14' 8"	16' 4"
Overall width	5' 6"	6' 0"
Overall height	6' 6"	6' 10"
Approx. shipping weight, lbs.	10,000	14,410

TRAILER MOUNTED (dual wheels)

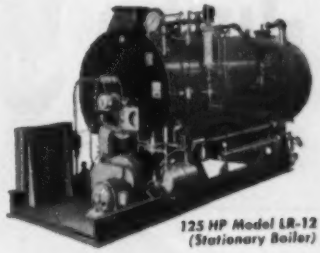
	LFM-8	LFM-12
Overall length	17' 9"	19' 10"
Overall width	8' 0"	7' 11"
Overall height	7' 9"	8' 6"

TRAILER MOUNTED (tandem wheels)

	LFM-8	LFM-12
Overall length	17' 9"	19' 10"
Overall width	7' 0"	7' 6"
Overall height	7' 9"	8' 5"
Approx. shipping weight, lbs.	14,000	18,000

STATIONARY

Shipped as a complete, ready-to-operate self-contained unit. For Asphalt Plants, Oil Bulk Stations, Ready-Mix Concrete and Concrete Block and Cast Products Curing Plants. Finished and tested under actual loads. Approved safety devices. Designed to A.S.M.E. Code. Hartford Insurance inspected and approved. Fast steaming, 80% efficiency —full load down to 30% rating when firing with oil. Low-fire start saves fuel. Burns oil, gas or combination oil or gas. Sizes: 15 to 500 HP; 15 to 250 psi.



125 HP Model LR-12 (Stationary Boiler)

SPECIFICATIONS

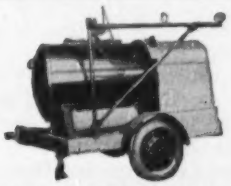
Boiler Horsepower—125

Lbs. Steam per hour from and at 212° F.—4,300

BTU Output, 1,000 per hour —4,180

EDR Steam Gross—17,370

EDR Steam Net, HP and A.C.C.—17,300



Unit has self-contained fuel and gasoline tanks.

PORTABLE PUMPING BOOSTER

Withdraws pumpable bitumens from tank cars. Heats by direct firing, recirculates, then delivers directly to distributor. Raises temperature 50° F. per hour. Larger, electric motor-driven unit available for stationary use.

SPECIFICATIONS

NO. 1A PUMPING BOOSTER
Operating burner at full cap. and pumping material:

Approx. 300 G.P.M. temperature rise	25- 35° F.
Approx. 180 G.P.M. temperature rise	45- 55° F.
Approx. 100 G.P.M. temperature rise	85- 95° F.
Approx. 50 G.P.M. temperature rise	170-180° F.

Heats 10,000 gal. car 35-45° F. per hour.

NO. 2AA PUMPING BOOSTER
Operating burner at full cap. and pumping material:

Approx. 350 G.P.M. temperature rise	45- 55° F.
Approx. 208 G.P.M. temperature rise	80- 90° F.
Approx. 112 G.P.M. temperature rise	110-120° F.
Approx. 60 G.P.M. temperature rise	200-210° F.

Heats 10,000-gal. car 55-65° F. per hour.

"DEUCE" Combination TANK-CAR HEATER AND PUMPING BOOSTER

"Deuce" pre-heats to pumpable consistency, circulates and heats to application temperature—then pumps and loads distributor. A.S.M.E. Code constructed. Four-pass boiler, equipped with condensate pump, is mounted on same frame with direct-fired booster and asphalt pump.

"Deuce"—15 HP, 125 lb. W.P. oil-fired boiler ad 1A Booster

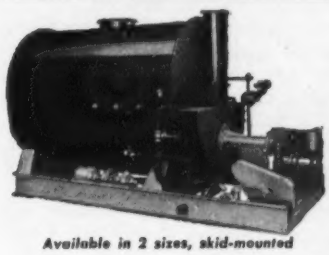
Operating Burner at Full Capacity and Pumping Materials

Approx. 300 G.P.M. Temperature rise	25- 35° F.
Approx. 180 G.P.M. Temperature rise	45- 55° F.
Approx. 100 G.P.M. Temperature rise	85- 95° F.
Approx. 50 G.P.M. Temperature rise	170-180° F.

Heats 10,000 gallon car 35-45° F. per hour.

SPECIFICATIONS

	Skid	Trailer
Overall length, in.	150	185
Overall width, in.	66	81
Overall height, in.	71	80
Shipping weight, lbs.	6350	7050



Available in 2 sizes, skid-mounted

PEAK-TEMP OIL BOOSTER

Heavy-duty, fully automatic booster uses high-flash-point oil as heat transfer medium to raise and maintain bituminous and heavy viscous materials to application temperatures. Fired by pressure-atomizing oil burner. Self-contained—ready for service line hookup.

SPECIFICATIONS

	Model 1201	Model 1801
Overall length, in.	145	169
Overall width, in.	66	66
Overall height, in.	78	96
Shipping weight, lbs. (approx.)	6100	7000
Burner Capacity (Maximum)	13 gph	18 gph

MOBILE TANK-CAR HEATER

Compact oil-fired boiler for operation at 125 lbs. W.P. Four-pass, down-draft, A.S.M.E. Code constructed. Uses fuel oil to and including Commercial No. 2. Has other year-round applications: Steam cleaning, culvert thawing, etc.

Available in Two or Three Car Sizes

SPECIFICATIONS

TWO-CAR HEATER, 28 BHP	Trailer	Skid
Overall length, in.	162	126
Overall width, in.	60¾	36½
Overall height, in.	69	53¼
Shipping weight, lbs.	4000	3900
THREE-CAR HEATER, 42 BHP		
Overall length, in.	164	127½
Overall width, in.	67	42
Overall height, in.	79½	59¼
Shipping weight, lbs.	4800	4500

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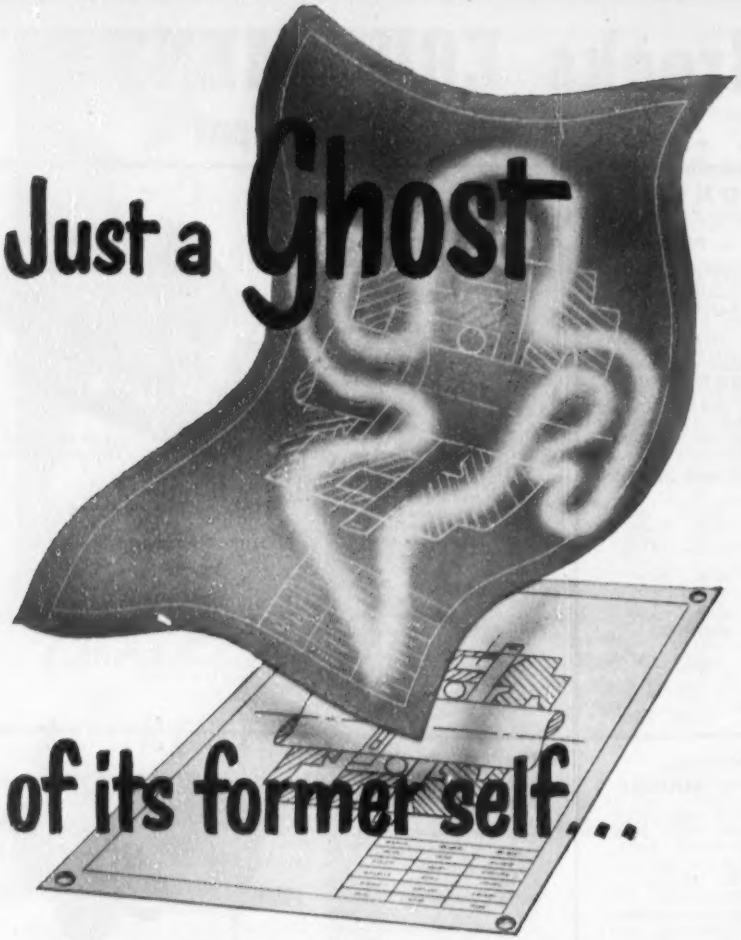

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feel compelled to find that he was negligent in failing to take proper steps to prevent the slides."

"Mr. Lash and the members of the power commission knew of the danger at Whatshan and they failed to take responsibile steps to avert it. They were not alert in the performance of their duties in respect to the care of the commission's property," the justice said.

"Without communication among themselves or with Mr. Lash, they hoped Lash would look after the situation without making proper investigation, they hoped that what Mr. Kirkpatrick (J. T. Kirkpatrick, station superintendent) was doing was adequate, whereas in fact what he was doing was totally inadequate and actually harmful."

• **Cleared slide by hosing**—Mr. Kirkpatrick's action, referred to by the power commission, consisted of hosing the base of the slide, which was slowly moving against the power plant, clearing it away as a mixture of mud and water. He also hosed high on the overhanging material in an effort to get it down to be cleared away.

Justice Clyne declared that when the leaks occurred, the tunnel should have been closed, inspected, and the leaks remedied.

"It would seem obvious that when it became apparent that the slope above the installations, which had cost $6 million to construct, had become unstable, steps should have been taken immediately to reduce it to safe proportions," he said.

"It is impossible to acquit the commission and Mr. Lash of negligence in the sense that they failed to take responsible action to avoid a danger of which they knew, or certainly ought to have known," he declared.

New three-man B. C. Power Commission, appointed by Premier Bennett, consists of Thomas Harold Crosby, chairman, regional manager for Canadian Westinghouse Ltd.; Dr. Hector J. McLeod, board member, dean of applied sciences, University of British Columbia; and James D. W. Blyth, Comptroller in Toronto for Brazilian Traction Power and Light Co.

"Down under" lab underground

The University of Sydney (Australia) will construct an atomic research laboratory 50 ft underground in order to study the action of mesons. Earth above the building will filter out the protons and electrons from cosmic rays—but not the mesons.

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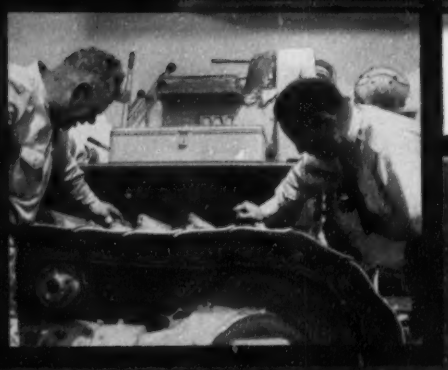

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They made "Molehills out of Mountains!"

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STANDARD OIL COMPANY STANDARD *(Indiana)*

OBITUARIES

Horace M. Lawrence, 64, an authority on building development and administration, died in Teaneck, N. J., April 6. For the last 23 years he had been with the American Standards Association, in charge of standardization projects for building codes, construction operations, materials and mining. He was a 1913 graduate of M.I.T.

Irving W. Patterson, 66, former chief engineer of the Rhode Island Board of Public Roads, later district engineer for the Lane Construction Co., and a pioneer in superhighway and military base construction, died in Hamilton, R. I., April 1.

Leon E. Hampton, 72, former surveyor of Howard County at Kokomo, Ind., and formerly an engineer with the Indiana State Highway Commission, died March 26 in Talladega, Ala.

John M. Snead, 72, construction engineer for the architects on the Union Terminal group and other large building projects in Cleveland, Ohio, died there March 31. Major Snead served in the Corps of Engineers in the First World War.

Charles E. Deakin, 72, a prominent building contractor in eastern Canada, died in Montreal, Que., March 28. His firm, the C. E. Deakin Construction Co., built the Windsor station in Montreal. In 1919 the Foundation Company of New York sent Mr. Deakin to Belgium, where he headed the work of reconstructing the famous Louvain Library destroyed by the Germans in the First World War.

Plastic screening tested in five different climates

Plastic-coated glass fiber insect screens may be found to have large potential use in military construction if they withstand exhaustive natural weathering tests now being conducted.

According to J. M. Osborn, project engineer for the Materials Branch of the Engineer Research and Development Laboratories, Ft. Belvoir, Va., long-range tests are underway to determine the capabilities of the screening at five different sites providing a wide variety of climatic conditions. They are being subjected to the desert at Yuma, Ariz.; the Arctic at Ft. Churchill, Canada, and the Tropics in Panama. They are also fighting off occasional hurricanes in Florida and enjoying comparatively smooth going at Ft. Belvoir.

"They wanted the finest," says R. F. Tickle of Adjustable Forms Co., Inc.

"So we used MASONITE CONCRETE FORM PRESDWOOD"

1000 Lake Shore Drive Bldg., Chicago. Architects: Sidney H. Morris and Associates. Shaw Metz & Dolio, Associate Architects. General Contractors: Loftus Contracting Co. and Jacobson Bros. Co. Formwork by: Adjustable Forms Co., Inc.

"This was a quality job on Chicago's famous Gold Coast. Nothing but the best would do. So, we used Masonite Concrete Form Presdwood to get a perfectly smooth concrete surface for the ceilings. When finished, they were ready for painting with a minimum of rubbing." You, too, can save these 3 ways:

1. Use the smooth side when you need a smooth surface to be painted or left unpainted.
2. Use the screen side for architectural concrete to provide a better paint bonding surface.
3. Use the screen side on concrete work where carborundum rubbing is specified—cuts hand rubbing costs 50% or more.

Extra advantages that work for you!

- Low first cost. Less than ½ that of other smooth-surface methods. Won't split, splinter or crack.
- Can be used again and again.
- Can be curved for arches, columns, etc.
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- Large 4′ x 8′ and 4′ x 12′ panels handle easily, create fewer fins.

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Is it simple to operate?
Will it operate from the EQUATOR to the POLE?
Does it save fuel and oil?
Will it put in 24 hours every day?
Will it run 6,000 PLUS hours before overhaul?

Send for Gardner-Denver Bulletin PC-12 *before* you buy.

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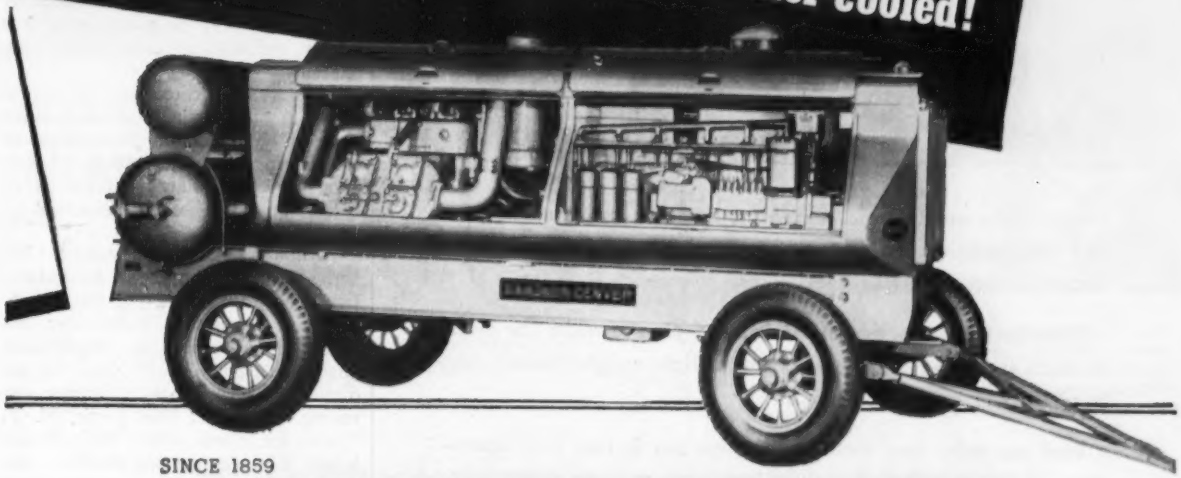
"600"
the answer is...
YES!
Because it's two-stage and fully water-cooled!



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PREFACE TO ALASKAN POWER

Naylor light-weight pipe is right at home on construction jobs like this dredging operation which is paving the way for hydro-electric power in Alaska.

This distinctive lockseam-spiralwelded pipe provides the extra strength for heavy duty service, yet its light-weight assures easy handling and installation.

Find out today how well Naylor pipe can fit into your operations—whether you need high or low pressure air or water lines. Ask for Bulletin No. 507.

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MEN AND JOBS

Douglas Trowbridge to retire; taught 44 years

Douglas S. Trowbridge—civil engineering professor at New York University for 44 years and senior faculty member since 1950 — will retire in June at the age of 65.

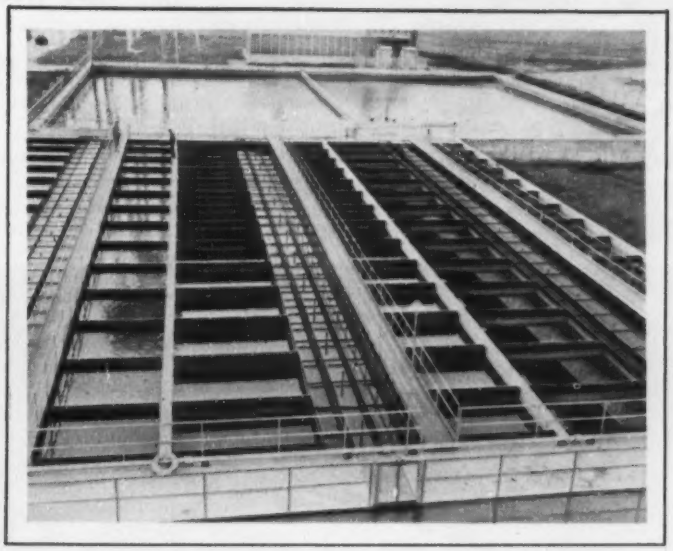
Last month fellow faculty members presented the professor with the first Trowbridge Gold Medal. Hereafter this award, which is to be financed by the faculty, will be given each year to an outstanding civil engineering student.

He started his career as a NYU professor in 1910—at a time when there were 500 students in the college of engineering and the college of arts and science. Today's enrollment in these same colleges has increased to 2,300.

Although he consistently has turned down permanent administrative posts that would cut into teaching time, Professor Trowbridge has pinch-hitted twice as department chairman. And for 31 years he has directed the university's summer surveying camp near Port Jervis, N. Y. There—for three weeks each June—junior civil engineering students undergo an intensive period of training in field work.

Professor Trowbridge's interest in the education of engineers brought recognition from the Society for the Promotion of Engineering Education (now the American Society for Engineering Education). It elected him chairman of the civil engineering division for the period from 1942 to 1945.

(*Men and Jobs continued on page 65*)



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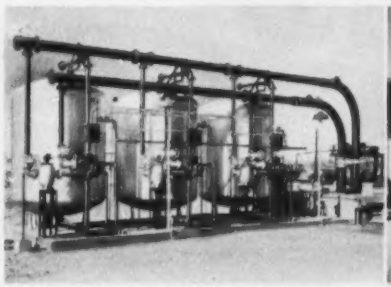
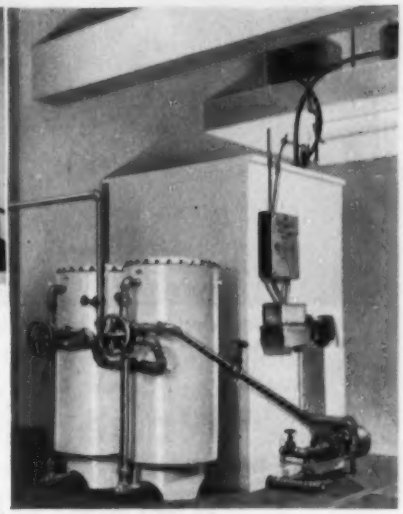


ZEOLITE (Ion Exchange) SOFTENERS remove total hardness. Reduce iron and manganese. Permutit multiport-valve control is fully automatic! Saves operator's time . . . increases efficiency.

FILTERS. Rapid type gravity filters in concrete or steel. Vertical or horizontal pressure filters. Manual or fully automatic multiport-type control for single units or batteries.



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PERMUTIT will make a free analysis of your city's water supply and make recommendations to you or your consultants. Remember — only Permutit manufactures both ion exchangers and all types of water conditioning equipment.

Write today for information on municipal water conditioning equipment. The Permutit Company, Dept. ENR-4, 330 West 42nd Street, New York 36, N. Y.

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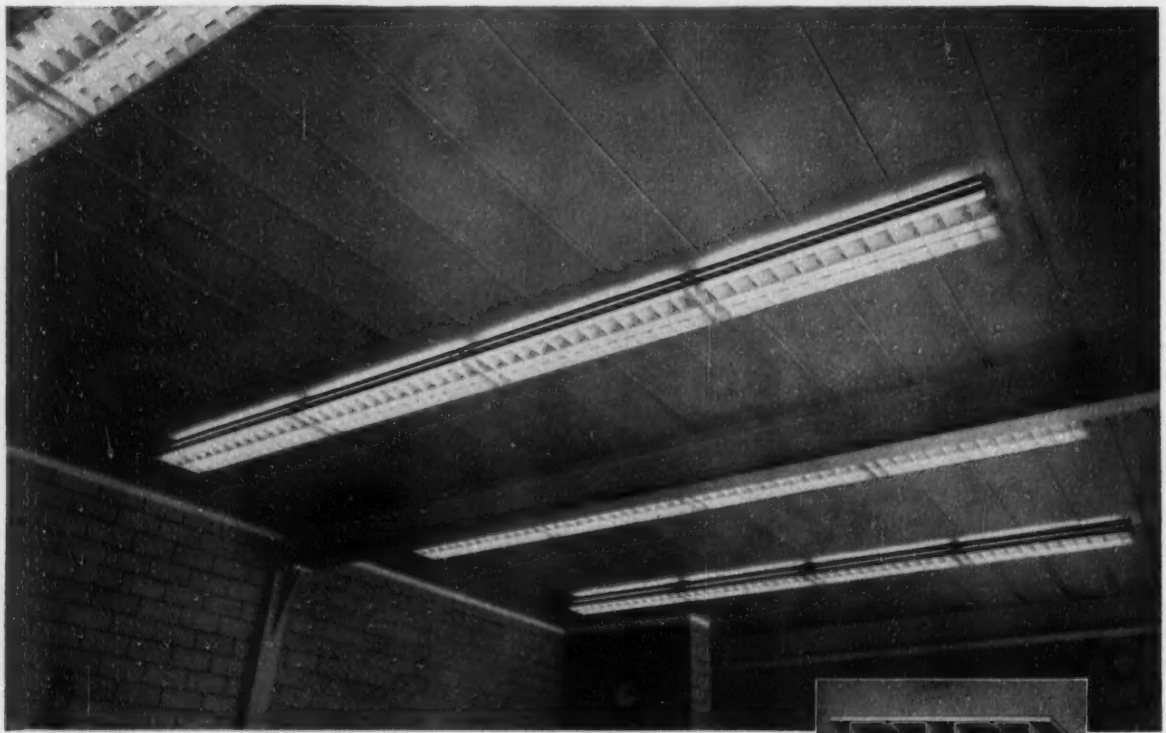
"A salute to those who made it possible" *



St. Mary's Parish School, Hammond, Ind. *Architect:* Bachman & Bertram, Hammond. *Contractors:* Swenson-Carlson Bldrs., Inc., East Chicago, Ind.

New Acoustical Structural "D" Panels. Width 24". Depth 1½" to 7½".

Noise disappears inside this ceiling!

There are no acoustical gimmicks stuck on this ceiling. Nothing that has to be applied to its surface by expensive tradesmen. Nothing that can come loose and fall down. Here the ceiling *itself* is the silencer. It is formed of remarkable *acoustical-structural,* long-span Fenestra* Building Panels.

This single compact package is beautifully finished structural ceiling, non-combustible acoustical treatment and acts as a joist system support for finished roofing. And, if your building has a second story, your Fenestra ceiling forms a strong, solid subfloor for rooms above. You can see the economy of using versatile Fenestra Building Panels.

Fenestra Acoustical Panel is a strong metal box beam (or beams) with a strong, structural top surface, a flat, perforated bottom surface and glass fiber insulation in the space between. These panels are made exclusively by Fenestra (Detroit Steel Products Company)—one of America's largest and best-known producers of metal building products.

For full details call your Fenestra Representative listed in the phone book yellow pages, or write, Detroit Steel Products Company, Dept. ER-4, 2286 E. Grand Blvd., Detroit 11, Michigan.

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* Your need for a maintenance-free, non-combustible, built-in acoustical treatment encouraged us to develop Fenestra Structural-Acoustical Building Panels—a great advancement in building products.

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Ft. Belvoir C. O. ends 42-year career

Major General Stanley L. Scott, commanding general of the Army Engineer center at Ft. Belvoir, Va., brought a 42-year military career to a close when he retired from active duty recently.

Commissioned in the Corps of Engineers in 1916 at West Point, he received his civil engineering degree at Massachusetts Institute of Technology in 1921.

Early in his career (1924) General Scott served as assistant district engineer at Louisville, Ky., and was in charge of construction of Dam 33 on the Ohio River. From 1934 to 1937 he was was an instructor at Ft. Belvoir's engineer school. While there, he was asked to return to Louisville to head the flood relief program.

Just before the outbreak of World War II, General Scott was division engineer of the corps' southwest division in Dallas, Tex. It was during this period that he received his first of three Distinguished Service Medals—for "exceptionally meritorious service" in carrying out an army housing project, constructing airfields, building facilities for production and storage of munitions and supplies.

General Scott left the United States four times for military duty. During World War I he took part in three campaigns in France, and later served with the army of occupation in Germany. In 1931 he was appointed district engineer in Honolulu, as well as administrator for the Public Works Administration there. In 1942 he was chief of staff of the Persian Gulf Command. His last overseas assignment came in 1948—commanding general of the Army forces in Alaska.

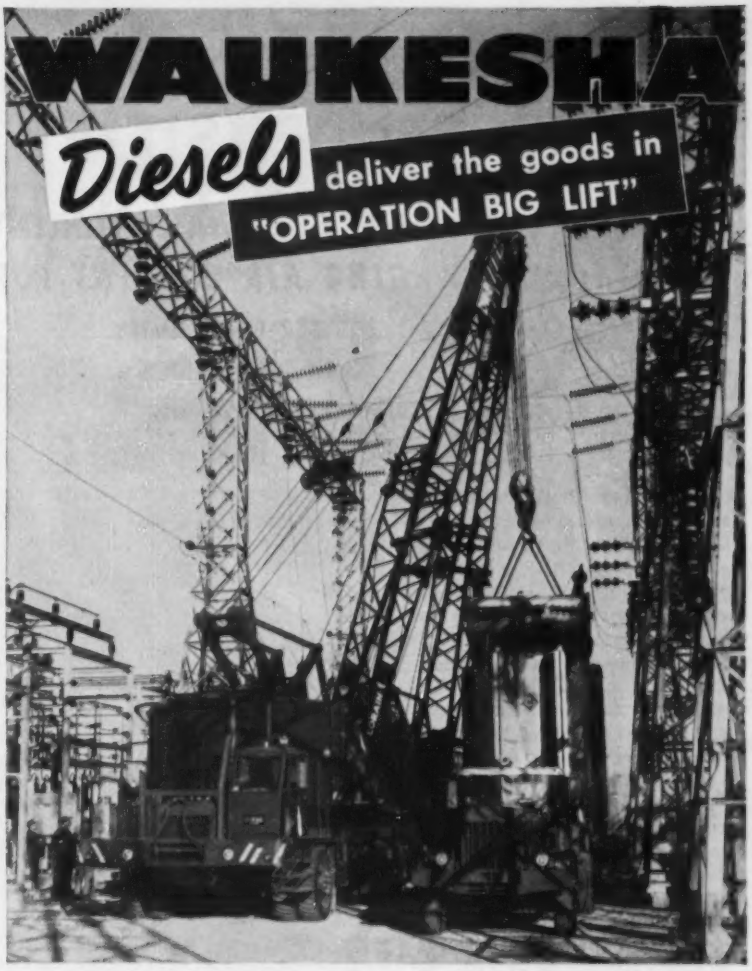
He assumed command of the engineer center three years ago. Notable achievements made under his command include the first all-Korean engineer officer class at the school, the experimental air drop of heavy engineer equipment at Davison Field, and the designing of a new family of military bridges.

Barber-Greene moves top staff

H. A. Barber has been elected president of Barber-Greene Co., Aurora, Ill. W. B. Greene, co-founder and president for the last nine years, will remain active in company management as chairman of the board of directors.

Barber, a vice-president since 1937, joined the company in 1933 as a field service engineer. Later as design de-

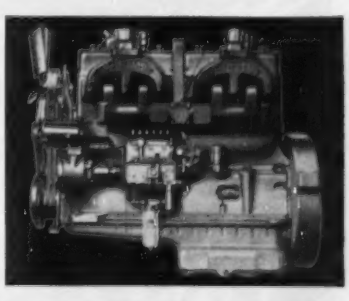
(Continued on page 66)



● It takes precision power to handle a heavy, delicate job like this. That means Waukesha power!

These two 45-ton MC-824 Lorain Moto-Cranes, owned by the City of Los Angeles, Dept. of Water & Power, moved three 62-ton AC transformers to a new sub-station near the Northrop Aviation Plant. These giant transformers were removed from cramped locations and placed in the midst of crowded high voltage equipment . . . an operation requiring precision power and perfect co-ordination between the two rigs, each equipped with a 50-foot boom.

The power that handled this job so smoothly, and without a hitch, was furnished by Waukesha Model WAKD Diesel engines, powering both the turntables and the carriers. For detailed information on the many advanced design and construction features of this Waukesha Diesel, send for Bulletin 1415.



6-WAKD WAUKESHA Super Duty Diesel. 6-cyl. 6¼-in. bore x 6½-in. stroke, 1197 cubic inch displacement.

241

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK ● TULSA ● LOS ANGELES

PLASTIMENT* CONCRETE DENSIFIER

CONTROLS SET AND REDUCES WATER CONTENT *WITHOUT CHANGING AIR CONTENT* FOR

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- CRACK RESISTANCE
- WATER RESISTANCE
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*Plastiment consistently produces higher structural values in concrete because it limits and controls the growth of water-consuming cement gels during mixing and placing of concrete. This action reduces the water-cement ratio and retards the set of all concretes, plain or air-entrained, regardless of type of cement or aggregate Uniformity of set and water content (the governing factors of uniform concrete quality) are made possible by changing Plastiment proportions with concrete-placing-temperatures and field conditions.

Controlled set and uniformly low water content—exclusive with Plastiment—means less segregation, shrinkage, cold joints and other defects, greater uniformity and resistance to abrasion, cracking and leakage.

Write for your copy of "Plastiment Concrete Densifier" booklet and the Sika Job Bulletin describing the job at right. ➤

11 APARTMENT HOUSES AT PARKMERCED, SAN FRANCISCO
REINFORCED CONCRETE WITH PLASTIMENT
For details on the above project, write for "SIKA JOB BULLETIN #8."

Sika **SIKA CHEMICAL CORPORATION**
PASSAIC, NEW JERSEY
BRANCH OFFICES: PITTSBURGH, SALT LAKE CITY, MONTREAL, CHICAGO, PANAMA • DEALERS IN PRINCIPAL CITIES

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Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

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Contract Core Drill Division • MICHIGAN CITY INDIANA

velopment engineer and chief engineer—one of his main jobs was assisting in the development of the firm's asphalt finisher.

The following officers were named vice-presidents: S. E. Faircloth, production coordinator; E. H. Holt, director of sales; J. D. Turner, director of publicity and promotion. H. E. Herting, comptroller; R. C. Heacock, director of manufacturing and engineering. J. M. Spence was elected treasurer; W. A. Greene, secretary; Urban Hipp, assistant treasurer, and F. J. Merrill, assistant secretary.

John G. Butter takes over top Iowa roadbuilding post

The man who moved last week into the top Iowa road building post—chief engineer of the Iowa State Highway Commission—is John G. Butter, former administration engineer for the commission.

The promotion means that Butter takes over as chief of the organization with which he began as an instrument man in 1919. He has been with the commission continuously—except for two brief periods—and appointment as administration engineer came in 1948.

The post had been held for the last 18 months by Edward F. Koch, who resigned April 1 for another job.

The commission also has announced other promotions among its veteran road-building engineers: Walter H. Root, from maintenance engineer to deputy chief engineer; Jack Reid, from assistant administration engineer to administration engineer; R. C. Boyd, from design engineer to maintainence engineer; Fred Schneider, from location engineer to design engineer.

Career briefs . . .

• **Anson Marston Award**—The Iowa Engineering Society has presented to Frank Kerekes, assistant dean of engineering at Iowa State College, the Anson Marston Award for outstanding contribution to the society's work in technical and professional development of its members. Professor Kerekes, a past president of the society, also has served as chairman of the Iowa Building Code Commission.

• **Army engineer assignment**—Col. Richard W. Pearson has been named New England division engineer (headquarters: Boston) for the Corps of Engineers, replacing Col. Leland H. Hewitt who is retiring from active service. The new division chief has been com-

(*Continued on page 68*)

In addition to serving as a 6,000-pound grader, the Maintainer can be equipped with hydraulic attachments for bulldozer, lift-loader, road planer, berm leveler, highway mower, broom, snow plow, patch roller and side dozer service.

Look What Typical Owners Say . . .

A MUNICIPALITY IN MAINE—"...performed jobs unbelievable for a machine of this sort. I can not laud too highly the work it has done."

A COUNTY IN MICHIGAN—" . . . This (Huber Maintainer) eliminated the use of a tractor and small grader and one operator with consequent savings in cost."

A CONTRACTOR IN FLORIDA—"They (Huber Maintainers) have earned us more money than any other piece of equipment we own."

A STATE IN THE NORTHWEST—"For the concrete pavement shoulder work which we are continually confronted with, the Maintainer has been a very satisfactory unit."

A TOWNSHIP IN PENNSYLVANIA—"The Huber Maintainer is tops with us (grading, loading, cleaning ditches, laying pipe)."

A CONTRACTOR IN CONNECTICUT—"Our Huber Maintainer has cut down our labor costs 50%."

HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.
Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

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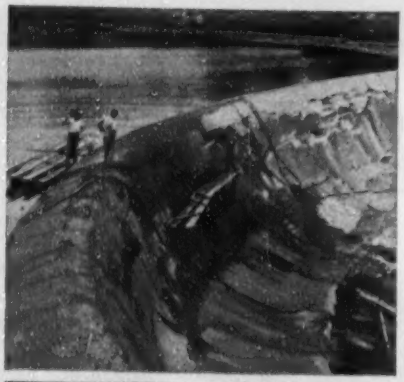

DAM REPAIRED WITH "GUNITE"

The two photographs show the Bulls Bridge Dam of the Connecticut Light and Power Company, which is one of many dams we have repaired for this company.

The upper view shows the work in progress, and gives some idea of the condition of this structure before repairs were made. The lower view is of the completed job.

After chipping out the loose and disintegrated concrete and sandblasting the entire area, heavy reinforcing mesh was placed over the surface of the old concrete and "GUNITE" applied two inches thick, plus the material required for filling deeply eroded portions.

Our 72-page bulletin A-2400 describes scores of similar "Gunite" jobs.

Write today for bulletin A-2400

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.

MANUFACTURERS OF THE "CEMENT GUN"

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NO CURRENT
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INDOOR AND OUTDOOR MODELS
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For permanent installation on projects or temporary use on construction jobs. Insure positive communication at all times even in emergencies because no batteries or other current is required. Minimum upkeep. Selective or common ringing and semi-selective or common talking.
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MEN AND JOBS

manding the 417th Engineer Aviation Brigade in Korea since April of last year.

• **Returns to turnpike post**—W. W. Wannamaker has been reappointed to his former post as executive director of the New Jersey Turnpike Authority. Wannamaker left the authority in 1951 to become chief engineer of the Orinoco Mining Co. (a subsidiary of United States Steel Corp.). He was in charge of engineering for development of the company's ore reserves in Venezuela.

• **Top management changes**—Elon Ellis has been promoted to vice-president and director of sales for Timber Structures, Inc. He has been with the firm 8 years—most recently as vice-president in charge of the Eastern division at Ramsey, N. J. George Price will be the new manager of the Eastern division; William E. Welch, vice-president in charge of the Western division; Frank E. Smith, general manager of the Central division.

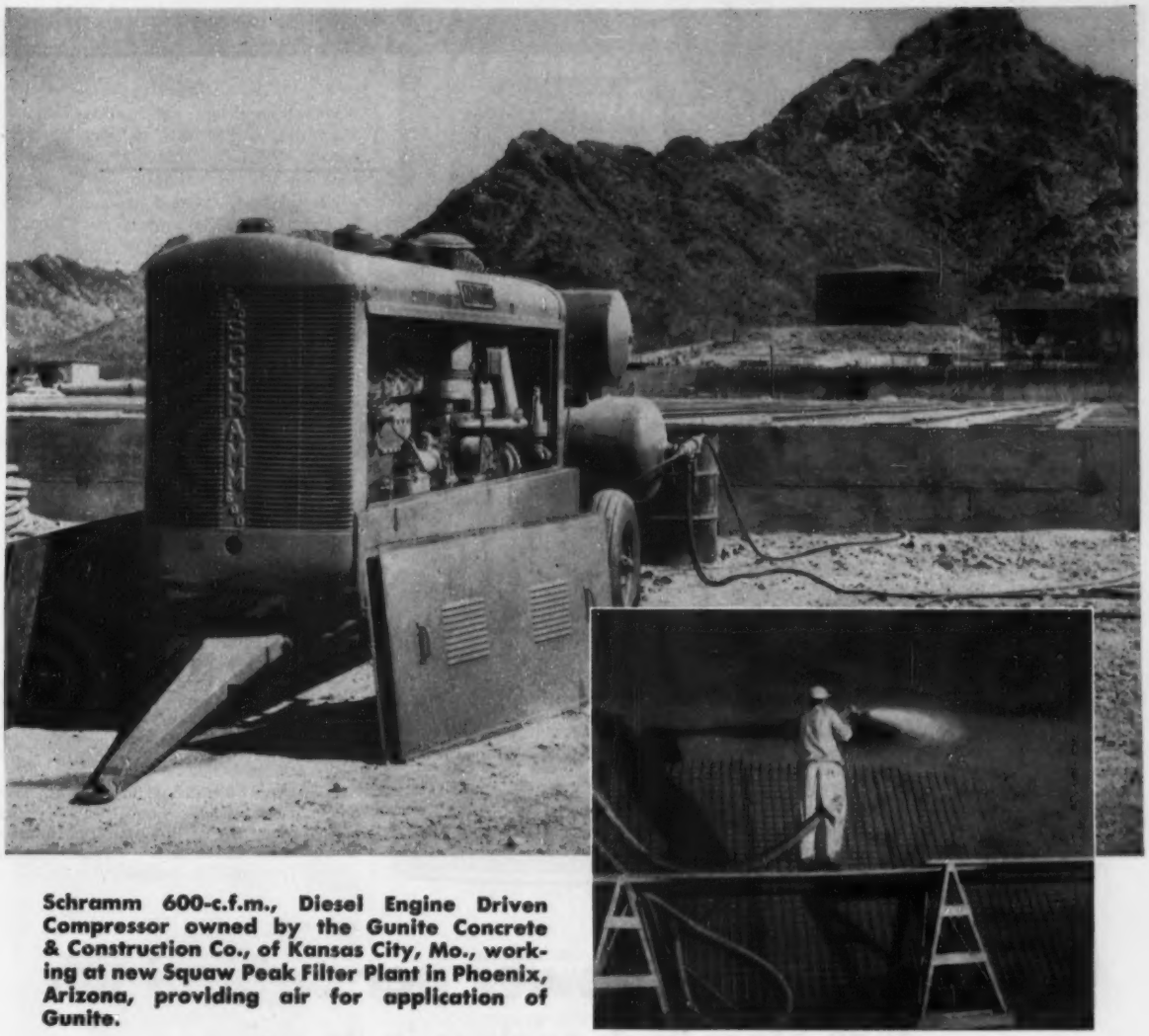
• **Federal appointment**—The Business and Defense Services Administration (under the Department of Commerce) has announced the appointment of Henry W. Hitzrot as director of the water and sewerage industries and utilities division. Hitzrot will serve without pay for six months on loan from the Dorr Co. of Stamford, Conn., where he has been special assistant for engineering sales.

• **Photogrammetrists' chairman**—Louis A. Woodward, vice-president of Jack Ammann Photogrammetric Engineers, San Antonio, Tex., has been elected chairman of the Association of Professional Photogrammetrists. He started his career with the U. S. Geological Survey in 1926, later served with the Army Engineers and the Soil Conservation Service of the Department of Agriculture.

• **Named vice-president**—John R. Dietz has been elected a vice-president of Gannett, Fleming, Corddry and Carpenter, Inc., consulting engineers, Harrisburg, Pa. Mr. Dietz' promotion stems from the fact that the organization's highway division, which he has headed for the last twelve years, has grown to large size and is still expanding.

• **Asphalt Institute engineers**—The Asphalt Institute has appointed three new district engineers. Dillard D. Woodson, formerly with the Virginia

(*Continued on page 71*)



Schramm 600-c.f.m., Diesel Engine Driven Compressor owned by the Gunite Concrete & Construction Co., of Kansas City, Mo., working at new Squaw Peak Filter Plant in Phoenix, Arizona, providing air for application of Gunite.

Here's why you should use the *SCHRAMM MODEL 600*

FUEL SAVINGS UP TO 30% . . . Pneumastat control . . . Modern engine design . . . Proper operating speeds . . . Less horse power required by compressor . . . Super-efficiency compressor design.

SIMPLIFIED DESIGN . . . Fewer parts . . . Engine parts are interchangeable with compressor parts for lower maintenance . . . Cam operated mechanical intake valves provide greater efficiency.

SAFETY FEATURES . . . Electric push-button starter . . . Stronger, 400# test air receiver . . . Heavy grill for radiator protection . . . Easy accessibility to operating parts . . . No protruding parts.

MORE PLUS FEATURES . . . Tool boxes large enough to carry complete assortment of tools . . . Engine and Compressor cooled by water and unit can be operated with doors in place . . . Dual fan belts.

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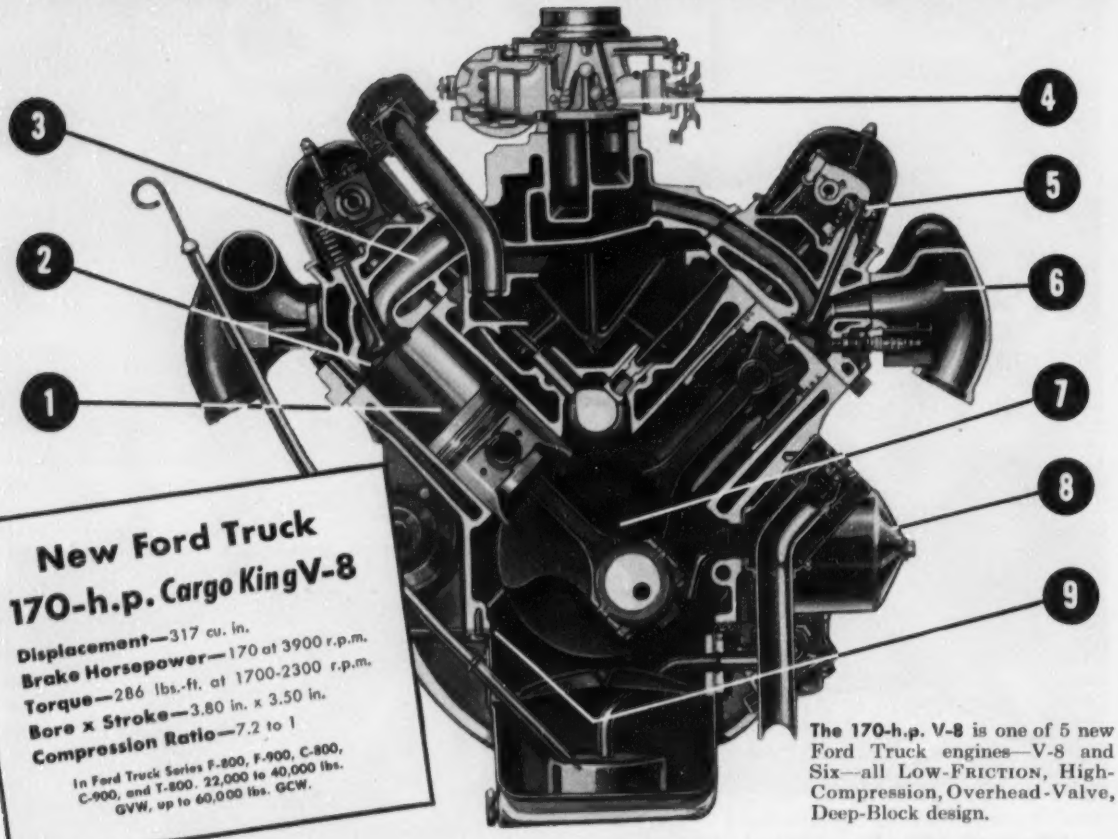
A SIZE AND MODEL FOR EVERY AIR NEED

ANOTHER WAY YOU SAVE WITH FORD *TRIPLE ECONOMY*



New Ford Truck
170-h.p. Cargo King V-8

Displacement—317 cu. in.
Brake Horsepower—170 at 3900 r.p.m.
Torque—286 lbs.-ft. at 1700-2300 r.p.m.
Bore x Stroke—3.80 in. x 3.50 in.
Compression Ratio—7.2 to 1

In Ford Truck Series F-800, F-900, C-800, C-900, and T-800. 22,000 to 40,000 lbs. GVW, up to 60,000 lbs. GCW.

The 170-h.p. V-8 is one of 5 new Ford Truck engines—V-8 and Six—all LOW-FRICTION, High-Compression, Overhead-Valve, Deep-Block design.

Up to 41% more power per cubic inch

—than other truck engines in its class!

Here's why the Cargo King V-8 gives you power with economy...the No. 1 saving in Ford Triple Economy!

1. Short-Stroke power—In the new *Cargo King* V-8, short-stroke design reduces piston travel as much as 34%. This cuts wear, repair costs, and internal friction losses . . . releases more "useful" power, saves gas. Cylinder and combustion chamber design permits larger intake and exhaust valves for more efficient fuel use, less dissipation of heat to cooling system. More energy per pound of fuel is converted into *usable*, load-moving power.

2. High-Turbulence combustion chambers are wedge-shaped to create high turbulence, give more efficient fuel-air combustion without pre-ignition.

3. Short-Reach intake manifold is two manifolds in one single casting. Carburetor mounted directly to manifold allows short passages, delivers uniform fuel charge to all cylinders for greatest power, easy starting.

4. Exclusive de-popper valve on dual concentric carburetor eliminates backfiring when decelerating.

5. Free-turn valves rotate freely for self-cleaning action, better seating, minimize valve warpage, wear and sticking.

6. Ram's Horn exhaust manifold improves breathing efficiency of new *Cargo King* by scavenging exhaust gases faster.

7. Precision-molded alloy iron crankshaft is a Ford exclusive. Permits more rigidity in design, with three times better self-damping.

8. Full-Flow oil filter cleans *all* oil before it reaches bearing surfaces, reduces cylinder wall, piston ring and bearing wear. Replaceable cartridge type.

9. Deep-skirt crankcase extends 2¾" below center of crankshaft for greater rigidity to resist distortion, provides maintenance of bearing alignment for long life and smooth engine performance.

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1. *New Gas-Saving Power*
2. *New Driver-Saving Ease*
3. *New Money-Saving Capacities*

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MORE TRUCK FOR YOUR MONEY!

For complete information, see your Ford Dealer, today, or write: FORD Division, FORD MOTOR CO., Dept. T-11, Box 658, Dearborn, Michigan.

highway department, will take over in Atlanta for the states of Georgia, Alabama, Florida, South Carolina and Tennessee. Frank H. Gardner, former chief paving engineer for the Military Air Transport Service, will have the New York State territory (outside of New York City and Long Island). Robert B. McKeagney, with the Army in the East Ocean Division as chief of the paving and materials section, has been appointed to the New England area with headquarters in Boston.

• **Sanitary engineering adviser**—Prof. Jack E. McKee, associate professor of sanitary engineering at California Institute of Technology, has been made a member of the advisory committee on sanitary engineering for the California State Department of Public Health.

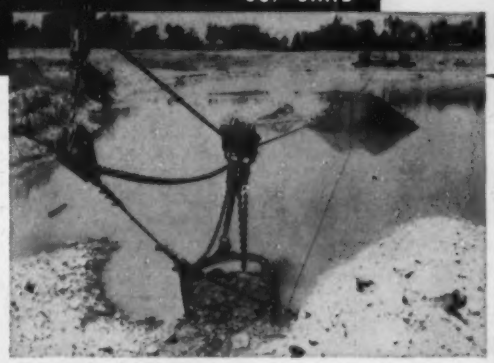
• **Planner changes cities**—Charles B. Ford, associate planner with the city plan board of Dayton, Ohio, has been named city plan director for Kalamazoo, Mich.

Mayo moves up

New duties are ahead for Frederick J. Mayo, slated to take over the post of executive vice-president of F. H. McGraw & Co. at the firm's home office in Hartford, Conn. Since 1951 he has been serving as vice-president and general manager in charge of the $1-billion construction project for the Atomic Energy Commission at Paducah, Ky. Mayo stepped up schedules, set up new administrative procedures, and pushed a safety program. But now that the A-bomb plant is nearing completion, he will be free for other duties.

the pit: *tough...* 70% ROCK 30% SAND

the machine: Sauerman 2½-cu yd slackline cableway excavator



the result:

"..a full bucket every trip"

Another actual field report—Helena Sand & Gravel Co., of Helena, Montana, switched to this Sauerman equipment in 1946. It's been in operation since then . . . successfully performing difficult underwater excavation of rock and colloidal sand where other equipment had failed.

Sauerman Slackline Cableways span water, bogs or pits . . . reach far, dig deep, lift and carry loads to hoppers or cone piles. However tough the pit, Sauerman equipment brings in a good load every trip.

With a Sauerman Slackline Cableway, one man—in safe position—operates a single machine . . . does the complete job, quickly, efficiently, economically! Sauerman Slackline Cableways range from ¼ to 3½ cu. yds. —span distances up to 1,000 feet . . . handle such materials as sand, gravel, clay, peat, ore and rock.

Write today for more information, including these handy field reports and catalog:

FR-216 Easy Excavating in a Tough Pit
FR-213 Cleaning Ponds Without Draining
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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

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J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **N. H., Berlin**—DIVERSION and RACEWAY CONTROL STRUCTURE—B.A. 4/19—Fish & Wildlife Service, Dpt. Interior, 59 Temple Pl., Boston 11, Mass., west Branch diversion and raceway control structure, U. S. Fish Cultural Station.

† **Vt., White River Junction**—BOILER REPLACEMENT—B.A. 5/11—Veterans Admin., Munitions Bldg., Wash., D. C., replacement of boilers, Bldg. No. 2, Veterans Admin. Center.

BIDS ASKED—BUILDINGS

Mass., Boston—HOSPITAL—B.A. 4/22—State, Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncey St., Boston Psychopathic Hospital, Roxbury. $900,000. Plans deposit $50, refundable. Allied Engineering Corp., 71 Proctor St., Roxbury, archts. Kendall Taylor & Co., Inc., 211 Columbus Ave., Boston, supervising. CD 10/10/52.

▲ **Conn., Greenwich**—SCHOOL—B.A. 5/4—Town, Bd. Educ., Havemeyer Bldg., Junior High School, Lockwood Rd. $2,000,000. Plans deposit $50. J. Gordon Carr, 80 W. 40 St., New York, N. Y., archt. Alfonso Alvarez, Jr., 243 Lorraine Ave., Upper Montclair, N. J., consult. engr. CD 11/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Arthur Venneri Co.**, 300 North Ave. East, Westfield, N. J., CA $3,205,000, est. $4,000,000. cantilever hangar, Air Force Base, ENG-19-016-54-69, PORTSMOUTH, N. H. U. S. Eng., 857 Comonwealth Ave., Boston, Mass. Bids Mar. 19. CD 3/24, under LB.

† **Arthur Venneri Co.**, 300 North Ave. East, Westfield, N. J. CA $810,000, est. $1,000,000. officers mess and B.O.Q., Air Force Base, ENG-19-016-54-70, PORTSMOUTH, N. H. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 4/2, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.

C. J. Maney Co., Inc., 173 Bedford St., Lexington, Mass. CA $2,174,920, est. $3,600,000. Contr. 831 Lynnway Hy., General Edwards Bridge-Lynn Shore Drive, Lynn and Nahant. Bids Mar. 25, awarded Apr. 2. CD 3/30, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John A. Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass. CA $1,045,034. RECREATIONAL BLDG., Dutton, Main and Buck Sts., BANGOR, ME. Bangor Recreation Center, c/o Bangor Hydro Electric Co., 33 State St., Bangor, Me. CD 2/24, under LB.

Agostime Constr. Co., 110 Meadow St., Providence, R. I. CA Approx. $800,000. CHURCH, Park St., PAWTUCKET, R. I. Church of the Sacred Heart, Rev. Robert Cassidy, pastor, 38 Park St., Pawtucket, R. I. Bids Mar. 30. CD 3/17.

▲ **The Wadhams & May Co.**, 15 Lewis St., Hartford, Conn., CA, $2,233,623, est. $2,200,000. Proj. B/A-1-105, Battell Hall Continued TREATMENT BLDG. for Women, MIDDLETOWN, CONN. State P. Wks. Comr., State Office Bldg., Hartford, Conn. Bids Mar. 10. CD 3/18, under LB.

Frouge Constr. Co., 74 Goodsell St., Bridgeport, Conn., LB, $872,000, Westover Elementary SCHOOL, Stillwater Ave., STAMFORD, CONN. City Bd. Educ., Supt. Schools, 151 Broad St., Stamford, Conn. Bids Mar. 31. CD 3/4.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **Pa., Pittsburgh**—WAREHOUSE—B.A. 4/20—U. S. Eng., 121 N. Broad St., base supply warehouse with refrigerated storage, Greater Pittsburgh Air Force Base, Coraopolis, Inv. No. ENG-36-109-54-207. $500,000. Hunting, Larsen & Dunnells, Inc., Century Bldg., Pittsburgh, engr.-archt. CD 3/10.

† **Maryland**—NIKE I—B.A. On Or About 4/22—U. S. Eng., 24 St. and Maryland Ave., P.O. Box 1715, Baltimore, Zone 3, NIKE I control and launching areas, Site BA-18-CL, incl. 2 underground missile storage structures, missile assembly and test bldg., generator bldg., personnel shelter, acid storage shed, ENG-18-020-54-40. Plans deposit $25.

New York-New Jersey—EXCAVATION—B.A. 4/27—The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., excavation for administration building, Lincoln Tunnel Third Tube, Contract LT-160.045. Plans deposit $30. CD 1/18.

BIDS ASKED—BUILDINGS

N. Y., Brooklyn—HEALTH CENTER—B.A. 4/28—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, general constr., plumbing; heating and ventilating; electrical work and lighting fixtures for constr. of Bedford Health Center, Prospect Pl. and Troy Ave. Plans deposit $50.

SOON LETS CONTRACT—BUILDINGS

Pa., Lansdale—HOSPITAL—North Penn Hospital, Lansdale, soon lets contract hospital addn., alterations. $800,000. Lawrie & Green, 321 N. Front St., Harrisburg, archts. CD 1/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1.

Lane Constr. Co., 37 Colony St., Meriden, Conn. LB $5,400,000, est. $7,221,000. c. conc. 7.74 mi. b. conc. opt. 1.07 mi., dual type pavement (cement and b. conc.) 0.55 mi., grading, drainage 0.89 mi., misc. work 0.13 mi., seven Hy. Sept. Comp. I-beam 180.1 ft., 155.6 ft., 243.3 ft., 127.4 ft., 200.9 ft., 218.3 ft., 179.3 ft., one R.R. Sep. plate girder 185.5 ft., one bridge built-up stringer 388 ft., one bridge twin concrete box 22.5 ft. each 10.38 mi. Rochester-Bushnell Basin, Pt. 1, S.H. 8223, S.H. 766 and SH 60 Interchanges; Pittsford-Palmyra Pt. 1, SH 766; Despatch-Pittsford Pt. 2, SH 461, Fairport (Brighton-Fairport Pt. 2), SH 60, Proj. U-UG-1107 (1), Contr. No. FASH 54-1; FARC 54-39. Monroe Co. Bids Apr. 1. CD 3/9.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith Office Bldg., Albany, Zone 1.

Binghamton Constr. Co., Inc., Marine Midland Bldg., Binghamton, N. Y., LB $357,609, est. $369,000, 4.24 mi. Owego-Campville, Pt. 3, SH 1870, FARC. 54-13, Tioga Co.;

Midland Asphalt Corp., 440 Main St., North Tonawanda, N. Y. LB $125,715, est. $146,000. 3.67 mi. Hartland-Medina Pt. 1, SH 5431, FARC. 54-12, Niagara Co.;

Kelleher Corp. Turners Falls, Mass., LB $133,340, est. $169,000, 2.75 mi. Crary ville-State Line SH 762, FARC 54-2, Columbia Co.;

County Asphalt, Inc., 129 Main St., Tarrytown, N. Y., LB $349,840 est. $355000, 5.93 mi. Bettsburg-McClure Pt. 2 SH 8285, FARC. 54-4, Broome Co.;

The Callanan Road Imprvt. Co., Quarry South St., South Bethlehem, N. Y., LB $98,557, est. $119,000, 1.49 mi. New Paltz-Plattekill, SH 572, New Paltz-Rifton, SH 308, FARC. 54-3, Ulster Co.;

W. H. Greene, Grand Blvd., Westbury, N. Y., LB $160,300, est. $210,000. 1.86 mi. Jericho Turnpike, SH 9020, FARC. 54-15, Nassau Co.;

Cold Spring Constr. Co., 3 Jackson St., Akron, N. Y., LB $538,768, est. $575,000 7.68 mi. Pavilion-Greigsville, Pts. 2 & 3, SH. 1777, Greigsville-Piffard, SH 1777-A, Geneseo-Piffard, SH 718, FARC. 54-44. Livingston and Wyoming Counties;

Berlanti Constr. Co., Inc., 15 Oakland Ave., Harrison, N. Y., LB $1,911,631, est. $2,040,000. 2.56 mi. Spring Valley-Knapps Corners, SH 689, Knapps Corners-Nyack, SH 5178, FARC. 54-41, Rockland Co.;

Warren Bros. Roads Co., 309 Basin St., Syracuse, N. Y., LB $196,780, est. $243,000, 7.7 mi. Watertown-Sacketts Harbor-Henderson, Pts. 2 & 1, SH 235, 181, Sacketts Harbor, SH 1131, FARC. 54-14, Jefferson Co.;

King Paving Corp., Aiplaus Rd., Schenectady, N. Y., LB $69,452, est. $95,000. 2.22 mi. Granville-Troy Stage, SH 104, Granville Village, SH 5404, FARC. 54-10, Washington Co.;

C. D. Murray Co., Inc., Lafayette Bldg., Syracuse, N. Y., LB $895,441, est. $982,000, 8.29 mi. Auburn-Seneca Falls, Pts. 2 & 1, S.H. 5042-590, FARC. 54-18, Cayuga and Seneca Counties; LB $217,649, est. $272,000. 4.31 mi. Bennettsburg-Perry City, Pt. 2, SH 1747, FARC. 54-24, Schuylkill Co.;

A. L. Blades & Sons, Hornell, N. Y., LB $258,757, est. $285,000. 3.51 mi. Belmont-Scio, SH 5476, Wellsville-Scio, SH 5129, FARC. 54-19, Allegheny Co.;

Green Island Const. Co., 594 Broadway, Watervliet N. Y. LB $317,128, est. $388,000, 7.69 mi. Chateaugay-Lyon Mountain, Pt. 2, SH 8355, FARC. 54-23, Clinton Co.;

Hudson River Constr. Co. Inc., 75 State St., Albany, N. Y. LB $148,968, est. $171,000, 3.92 mi. Eagle Mills-Clums Corners, SH 631, Brick Church-Rock Hollow, SH 197, FARC. 54-7, Rensselaer Co.;

Dale Eng. Co., 404 Court St., Utica 4, N. Y., LB $286,669, est. $324,000, 1.79 mi. Clinton Forks-Middle Settlement, Utica-Oneida Castle, Pt. 1, SH 250, Deansboro-New Hartford, SH 761, FASSH. 54-2. FARC 54-42, Oneida Co.;

E. G. DeLia & Sons Constr. Corp., 30 Campion Rd., New Hartford, N. Y., LB $459,769, est. $495,000, 7.57 mi. Little Falls-Dolgeville, SH 133, Manheim Center-Salisbury Center, SH 463, FARC. 54-35, Herkimer Co.;

Holmes & Murphy, Inc., Bank St., Orchard Park, N. Y. LB $383,222, est. $460,000, 6.33 mi. Wales Center-Varysburg Pt. 2, SH 8092, FARC. 54-37, Wyoming Co. Bids Apr. 1. CD 3/9.

▲ **General Railway Signal Co.**, 801 West Ave., Rochester, N. Y., CA, $1,965,775, furnishing, installing signal equipment for 60th St. Tunnel Connection of BMT Div. to Queens Line IND Div., Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids Mar. 9. CD 1/28.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg.

E. M. Brown, Inc., Clearfield, Pa., CA $1,065,894, constr. 34,366 ft. crushed aggregate base with bit. surf. 22 ft. wide, T. R. U. S. 309 and 22, North Towanda and Ulster Twps., Bradford Co. Mar. 19, awarded Mar. 31. CD 3/23, under LB.

Joseph L. Lecce, 612 W. Edwin St., Williamsport, Pa. LB $431,430, est. $320,000. imprv. electrical distr. sys., Laurelton State Village, LAURELTON, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Mar. 31. CD 3/9.

Vinton Constr. Co., 907 Gist Ave., Silver Spring, Md., and **Bles & Muns Constr. Co.**, McLean, Va., LB, $376,588, stormwater and service sewers in New York Ave. N.E. between Montana and S. Dakota Aves., WASH., D. C. D. C. Govt., Dpt. Sanitary Eng., 499 Pa. Ave. N.W., Wash., D. C. Bids Mar. 30. CD 3/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Fulton Terrace, Inc.**, 16 Court St., Brooklyn 2, N. Y. Separate Contracts. $1,000,000. 6 story APARTMENT, 7251-69 Shore Rd., BROOKLYN, N. Y. CD 1/15.

▲ **W. I. C. Co.**, c/o Lama, Proskauer & Prober, archts., 395 Pearl St., Brooklyn 1, N. Y. Separate Contracts. $1,408,000. Four 6 story APARTMENTS, 80 St. and 45 Ave., ELMHURST, N. Y. CD 12/16.

▲ **Northway Gardens, Inc.**, 332 E. 149 St., New York 51, N. Y., Separate Contracts. $1,000,000. 6 story APARTMENT, Thwaite Pl. and Barker Ave., NEW YORK, N. Y. CD 12/23.

▲ **Banks & Lee**, Tower Bldg., Wash., D. C. CA Est. $1,200,000. 117-unit 2 story, brick, cinder block duplex APARTMENTS, Riggs Rd. between University Land and Keokuk St., COLLEGE PARK, MD. Isadore Gudelsky, Tower Bldg., Wash., D. C. Ted Englehardt, 927 Pershing Dr., Silver Spring, Md., archt.

H. E. Stoudt & Son, 1212 S. 5 St., Allentown, Pa. CA. $703,800. DORMITORIES, BOILER HOUSE, GARAGE and STORAGE ROOM, Fountain Hill, BETHLEHEM, PA. St. Luke's Hospital, Ostrium St., Bethlehem, Pa. Crow, Lewis & Wick, 200 Fifth Ave., New York, N. Y., archts.

SOUTH

BIDS ASKED—BUILDINGS

▲† **Ky., Fort Knox**—HOSPITAL—B.A. 5/20—U.S. Eng., 380 W. Broadway, Louisville, station hospital,

(Continued on page 74)

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviolved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
B.A.	**Bids Asked**
ENR	**Engineering News-Record**
CD	**Engineering News-Record Construction Daily**

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MANITOWOC — again selected to handle the tough, rough assignments.

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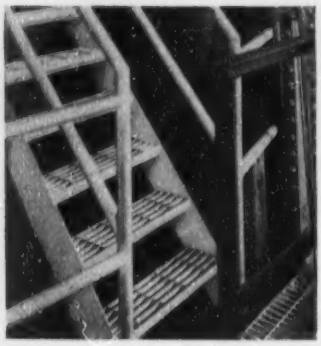

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(Continued from page 72)

Eng-15-029-54-55, $7,500,000. Plans deposit $100, York & Sawyer, 101 Park Ave., New York, N. Y., archts. CD 12/29, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **A. G. Pinkston Co.**, 1805 County St., Portsmouth, Va., CA **$1,325,000**. steam distr. sys., Naval Amphibious Base, NOY 78216, LITTLE CREEK, VA. P. Wks. Office Fifth Navl Dist., U. S. Naval Base, Norfolk, Va. Bids Mar. 16. CD 3/19 under LB.

▲ **E. W. Williams Co.**, 1269 E. Princess Anne Rd., Norfolk, Va. and **W. H. Scott, Inc.**, Box 418 Franklin, Va., CA **$1,646,869**. paving, grading, drainage, fencing, etc. Naval Amphibious Base, NOY 78225, Spec. 37651. LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Feb. 23. CD 3/3, under LB.

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh.

Ballenger Paving Co., Box 927, Greenville, S. C., LB **$94,486**, est. $75,000-$100,000, structures U. S. 301, Proj. No. 2958, F-394 (9), Wilson Co.;

Crowder Constr. Co., 1123 E. 10 St., Charlotte, N. C. LB **$181,216**, est. $200,000-$225,000, structures 9.32 mi. U. S. 70, Proj. 6711, SF-202 (5), Rowan Co.; LB **$163,542**, est. $175,000-$200,000, structures, 7.21 mi. U.S. 29 (reloc.), Proj. No. 8228, F.I. 653 (2), Cleveland and Gaston Counties; cancelled bids to have been opened Mar. 30, replacing Atlantic Coast Line R.R. underpass, U.S. 64 in Williamston, Proj. No. 1554, F-152 (6), Martin Co., $125,000-$150,000, will re-advertise. CD 3/22.

▲ NORTH CROLINA—State Hy. & P. Wks. Comn., Raleigh.

J. S. Hill Constr. Co., Washington, N. C., LB **$73,362**, est. $75,000-$100,000, grading 6.44 mi. Proj. No. 2-108, S-639 (1), Beaufort Co.;

C. C. Mangum, Inc., 3010 Hillsboro St., Raleigh, N. C., LB **$77,351**, est. $100,000-$125,000, STBC, b. conc. binder and surf. type F-2, 1.78 mi., Proj. No. 2282, F-702 (1), BS 2-7-18-25, Greene Co.;

Grannis & Sloan, Box 3006, Fayetteville, N. C., LB **$90,085**, est. $125,000-$150,000. grading 4.58 mi. U.S. 301 (reloc.), Proj. No. 2958, F-394 (9), Wilson Co.;

F. D. Cline Paving Co., Box 349, Raleigh, N. C., LB **$120,705**, est $125,000-$150,000. STBC bit. surf. tr. or sand asph. or b. conc. surf. 9.48 mi. U.S. 74 and 76, Proj. No. 3-207, S-640 (3), Columbus Co.;

Blankenship Bros., Box 3150, Charlotte, N. C., LB **$604,427**, est. $400,000-$500,000, subgrade reinf. and 9 in. conc. pavement or SABC and bit. surf. tr. 16.41 mi. US 70 (reloc.), Proj. 5012, I-644 (8), Alamance and Orange Counties;

Gilbert Eng. Co., Statesville, N. C., LB **$160,903**, est. $225,000-$250,000, grading 9.32 mi. US 70, Proj. No. 6711, SF-202 (5), Rowan Co.; LB **$194,866**, est. $250,000-$300,000, grading 7.21 mi. U.S. 29 (reloc.), Proj. No. 8228, F.I. 653 (2), Cleveland and Gaston Counties;

Kerr Sand Co., Hickory, N. C., LB **$248,693**, est. $300,000-$400,000, CABC, bit. surf. tr. 2.21 mi. U.S. 70 (reloc.), Proj. No. 8036, F-62 (6), Buncombe Co.;

H. F. Ramsey Co., Inc., Box 5146, Biltmore Station, Asheville, N. C., LB **$245,476**, est. $300,000-$400,000, CABC, bit. surf. tr. 5.65 mi. Proj. No. 0-100, S-651 (2), Avery Co.;

Dickerson, Inc., Box 448, Monroe, N. C., LB **$104,851**, est. $100,000-$125,000, sand asph. surf. b. conc. binder and surf. Class I and H, 19.2 mi. NC 33 and 171 and county roads, Proj. No. BS-2-6-15-120, BS 2-6-15-123, BS 2-7-15-26, BS 2-7-15-28, 2-9-15-220, 2-9-15-230, 2-9-17-246, Beaufort and Craven Counties; LB **$65,424**, est. $75,000-$100,000, sand asph. or b. conc. base and surf. course 17.69 mi. NC 42, 95 and 124, U.S. 64, Proj. No. BS 4-6-29-148, BS 4-7-29-25, Code 5900-419, Code 5900-429, Code 5900-438, Edgecombe Co.; LB **$73,810**, est. $75,000-$100,000, sand asph. or b. conc. base and surf. course 18.25 mi. NC 48, 481, 561 and 125, Proj. BS 4-6-30-161, BS 4-7-30-23, Code 5900-416, Code 5900-433, Halifax Co.; LB **$88,589**, est. $100,000-$125,000, sand asph. or b. conc. base and surf. course 22.2 mi. NC 39 (part), Proj. BS 4-6-31-167, BS 4-7-41-56, Code 5900-437, Code 5900-406, Johnston Co.; LB **$62,381**, est. $50,000-$75,000, sand asph. or b. conc. surf. course, Type F-2, 15.5 mi., Proj. BS 6-7-44-48, BS 6-7-46-61, Cumberland and Robeson Counties.

Barnus Constr. Co., Box 395, Kinston, N. C., LB **$74,000**, est. $75,000-$100,000. sand asph. base, b. conc. surf. Class 1 and comb. concrete curb and gutter, 4.77 mi. US 70 (part), Proj. BS 2-6-16-128, BS 2-6-16-132, 2-9-16-237, Code 5900-228, Carteret Co.;

E. B. Towles Constr. Co., Inc., Box 1617, Wilmington, N. C., LB **$64,468**, est. $50,000-$75,000, b. conc. surf. course, Class I, 9.16 mi. NC 87, Proj. BS 3-6-23-13-8, Brunswick Co. Bids Mar. 30. CD 3/22.

▲ **Rea Constr. Co.**, Pineville Rd., Charlotte, N. C., CA **$1,837,750**, Contr. 3, general constr. Irwin Creek Sewage Treatment plant, CHARLOTTE, N. C. City, Henry Yancey, city mgr., Charlotte, N. C. Bids Mar. 17. CD 3/24 under LB.

† **U. S. Eng.**, P.O. Box 867, Little Rock, Ark., cancelled bids to have been opened Apr. 6, bomb and gunnery range, Alexandria Air Force Base, ENG-03-050-54-37, ALEXANDRIA, LA. CD 3/31.

▲ KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,

Elizabethtown Paving Co., Inc., Elizabethtown, Ky. LB $107,728. conc. surf. 14.585 mi. various roads, Edmonson Co.;

A. W. Walker & Son, Mount Sterling, Ky. LB **$61,179**. conc. surf. Class 1 9.701 mi. various roads, Clark, Estill and Powell Counties;

(Continued on page 76)

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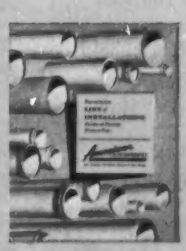

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(Continued from page 74)

R. E. Gaddie, Inc., Bowling Green, Ky. LB $95,387. conc. surf. Class I 20.969 mi. various roads, Laurel and Jackson Counties;

Eaton Oil Wks., Covington, Ky. LB $66,410. bit. surf. Class C-1 12.197 mi. various roads, RS 8-370, 8-290, 8-450, SP 8-370, 8-450, Boone Co.;

R. B. Tyler Co., 1446 Levering St., Louisville, Ky. LB $287,449. bit. surf. Class I conc. base wid'n. 32.546 mi. various roads, Calloway, Fulton, Graves, Hickman and Marshall Counties; LB $61,494, rock asph. surf. 11.234 mi. various roads, Bullitt and Spencer Counties;

Eaton Asphalt Paving Co., Covington, Ky. LB $112,259, rock asph. surf. 21.378 mi. various roads, Adair and Russell Counties.

Carey Constr. Co., Citizens Bank Bldg., Lexington, Ky. and **H. C. Adams**, 968 Delaware Ave., Lexington, Ky. LB $93,677. rock asph. surf. 11.967 mi. various roads, Fayette, Jessamine and Woodford Counties;

Kelly Contg. Co., Inc., Fincastle Bldg., Louisville, Ky. LB $100,748. c.conc. 0.459 mi. Lawrenceburg-Versailles Rd., F 208 (5), SP 3-71, Anderson Co.; LB $160,780. bit. surf. Class I machine patching 19.318 mi. various roads, McCreary and Pulaski Counties;

Middle West Roads Co., Noblesville, Ind. LB $217,464. bit. conc. Class I rock asph. surf. 31.789 mi. various roads, Ballard, Livingston, Lyon and McCracken Counties;

The Highland Co., Inc., 644 Baxter Ave., Louisville, Ky. LB $110,992 rock asph. on conc. surf. Class I binder 10.871 mi. various roads, Barren and Hart Counties; LB $109,526, bit. surf. Class I rock asph. surf. 24.6 mi. various roads, Barren Co.,

Hinkle Contg. Co., Paris, Ky. LB $62,733. conc. Class I surf. binder 13.262 mi. various roads, Anderson and Woodford Counties; LB $111,197, conc. surf. Class I 17.579 mi. various roads, Grant and Scott Counties; LB $177,164. conc. surf. Class I 39.354 mi. various roads, Mercer, Garrard, Washington and Marion Counties;

Corum & Edwards, Inc., Madisonville, Ky. LB $471,317, conc. surf. Class I 8.864 mi. Glasgow-Hodgenville Rd., F 28 (7) SP 5-12, Barren Co.;

Breslin Constr. Co., Inc., 1433 S. Preston St., Louisville 8, Ky. LB $70,004. conc. surf. Class I waterbound macad. sub-base 1.101 mi. Jeffersontown-Fisherville Rd., S 123 (2), SP 56-98, Jefferson Co. Bids Mar. 26. CD 3/10.

BUILDINGS

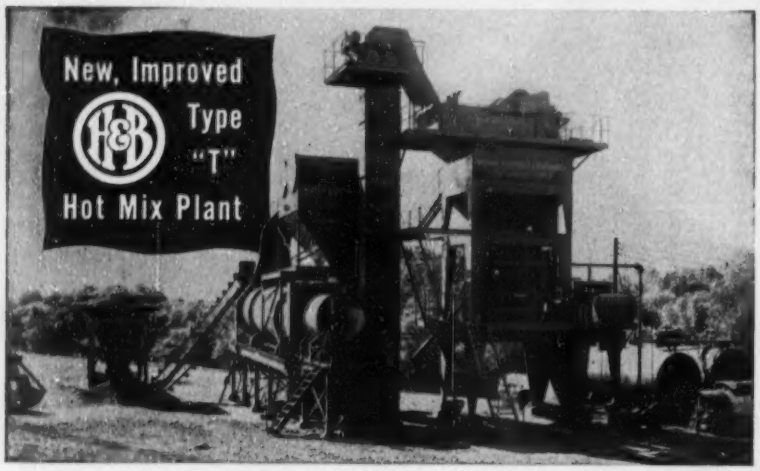
LOW BIDS AND CONTRACTS

▲ **Merando, Inc.**, 814 Fourth St., N. E., Wash. D. C., CA, $1,622,854. 2 story masonry Alexandria HIGH SCHOOL, ALEXANDRIA, VA. City School Bd., 418 S Washington St., Alexandria, Va. Bids Mar. 17. CD 322, under LB.

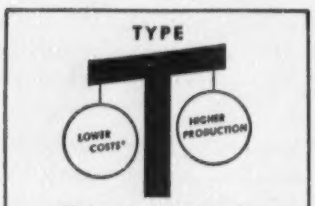
B & B Constr. Co. (Robert Fiscella) 131 Harbor Drive, Hampton, Va. Owner Builds, $352,000, 44 one-story frame RESIDENCES, HAMPTON, VA.

▲ **T. A. Loving & CO.**, Goldsboro, N. C., CA, $1,070,800. HOSPITAL and ADMISSIONS BLDG. at State Hospital, MORGANTOWN, N. C. SLate Bd. Control, Raleigh, N. C. Bids Mar. 18. CD 3/24, under LB.

▲ **Blake Constr. Co.**, 33 E. St. S.W., Wash., D. C. CA $1,978,000. 5 story public WELFARE BLDG., BATON ROUGE, LA. State, Dpt. P. Welfare, State Capitol, Baton Rouge, La. Bids Mar. 30. CD 3/9.



Increased Production—Lower Maintenance Costs



*Both original and maintenance

New Structural Design—All-welded bent plate construction.

Flat Screen—Adequate screening area on all sizes.

Self-Contained Dust Bin—Empties directly into weigh box, eliminating screw conveyor.

Trunnion Roll Drive—on dryer, eliminating vibration and reducing maintenance costs.

The new H & B Type "T" incorporates, in the basic plant, all of the major improvements of the past 20 years. New structural design and many exclusive features combine to make a plant that has already established outstanding records in both production and maintenance.

In addition to the features listed at the left, air controls and self-contained overflows are standard equipment on all Type "T" plants. No loose pieces to move or erect. 4 sizes—from 25 tons to 160 tons per hour—to meet your requirements. Available with electric, Diesel electric, Diesel or gasoline power. Factory wired plants available when electric power is used.

For specifications and complete information, write for Bulletin T-54.

HETHERINGTON & BERNER INC.
Engineers • Manufacturers
730 KENTUCKY AVENUE • INDIANAPOLIS 7, INDIANA

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

Ill., Caseyville—CHURCH, etc.—B.A. 4/30—St. John's Evangelical & Reformed Church, U. S. No. 50, Caseyville Twp., 1 story, 53x101 ft., brick, steel, cut stone church and educational bldg. Bids Mar. 4 rejected. Froese, Maak, & Becker, 706 Olive St., St. Louis, 1, Mo., archts. CD 2/24.

† **Mich., Alpena**—WEATHER STATION FACILITIES—B.A. 5/6—U. S. Eng., 1900 Cadillac Tower, Detroit, Zone 26, weather station facilities, incl. all related work necessary and appurtenant thereto, at Alpena County Airport, Eng.-20-084-54-47. Plans deposit $25.

BIDS ASKED—BUILDINGS

Wis., Elkhorn—ADMINISTRATION, etc.—B.A. 4/22—Walworth Co., Elkhorn, 2 story bsmt., 68x110 ft., rein.-con., steel, brick, administration and service bldg. Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Milwaukee, Zone 2, archts. CD 6/8/45.

† **Wis., Wood**—LAUNDRY—B.A. 5/25—Veterans Admin. Munitions Bldg., Wash., D. C., laundry Building, 102 Veterans Administration Center.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Contracting & Material Co.**, 1235 Dodge St., Evanston, Ill., LB, $1,052,074, paving Congress Expressway;

W. J. Sheppard, 1412 W. Altgeld St., Chicago 14, Ill., LB, $507,345, grading Congress Expressway from Kostner to Pulaski Sts.;

Krug Excavating Co., 11835 S. Central Park Ave., Blue Island, Ill., LB, $410,883, grading Congress Expressway from Laramie to Cicero Sts., CHICAGO, ILL. Cook County, County Bldg., Chicago, Ill. Bids Mar. 30.

W. J. Lazynski, Inc., 4445 N. 124 St., Milwaukee 16, Wis., CA, $120,800. sewer and water service in area between E. Ohio Ave., E. Norwich St., W. Whitnall Ave. and S. Pine Ave., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids Mar. 23, awarded Mar. 30

Park Engineering Co., R 1, Caledonia, Racine, Wis., LB, $303,867, Sections 2 and 3;

W. J. Lazynski, Inc., 4445 N. 124 St., Milwaukee, 16, Wis., LB, $256,816, Section 1, sanitary sewerage sys. WAUWATOSA, WIS. Town, 2000 N. Lovers Lane Rd., Wauwatosa, 13, Wis. Bids Mar. 29. CD 3/17.

Pierson Contg. Co., 609 Eddy Bldg., Saginaw, Mich. CA $379,511, c. conc. paving Syracuse, Woodridge, Osier, Charles, Lowell Sts., etc.;

Midland Constr. Co., Midland, Mich. CA, $168,878. asphalt paving Bristol, Houghton, Weber and Congress Sts., SAGINAW, MICH. City, C. A. Miller, city mgr., Saginaw, Mich. Bids Mar. 2 CD 2/18.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Catalytic Constr. Co.**, 1528 Walnut St., Phila., Pa., CA Approx. $3,000,000. houdriflow catalytic CRACKING UNIT, 27,000 bbls. daily capacity, TOLEDO, O. Sun Oil Co., 1608 Walnut St., Phila., Pa.

▲ **Wm. C. Kuhlmann Co.**, 732 N. Cicero St., Chicago, Ill., CA, $1,500,000, HIGH SCHOOL, CHICAGO, ILL. St. Catherine of Sienna Parish, 5620 Washington Blvd., Chicago, Ill. Bids Mar. 25, awarded Mar. 30. CD 3/9.

▲† **Charles Harris Co.**, 474 University Ave., St. Paul, Minn., CA, $1,795,300, 12 INDUSTRIAL BUILDINGS, 6 tank shelters, related facilities, Badger Ordnance Works, ENG-47-013-54-17, BARABOO, WIS. U. S. Eng., 428 Federal Bldg., Milwaukee, Wis. Bids Mar. 26. CD 4/1.

▲ **Selzer-Ornst Co.**, 6222 W. State St., Wauwatosa 13, Wis., CA, $1,000,000, 13 story, 70x115 ft., APARTMENT Incl. 81 units, MILWAUKEE, WIS. Lodgewood Co., 2156 S. 4 St., Milwaukee, Wis. Bids Mar. 17. CD 2/24.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Kan., Olathe—B.A. 4/26—City Comn., c/o Fred Miller, water comr., dam, intake tower, spillway for new reservoir lake, $590,000. Black & Veatch, 4705 Broadway, Kansas City, Mo., assoc. engrs. Payne & Brockway, Olathe, city engrs. CD 10/27.

† **Missouri**—B.A. 5/4—U. S. Eng., P. O. Box 97, Memphis 1, Tenn., 370,000 cu. yd. riverside enlargement, roadway embankment, spur levee enlargement, artificial berm Levee Item No. R-836, Cottonwood, approx. Levee Stations 37 plus 48, 42 plus 0, Lainer St. Francis Levee Dist., along right bank of Mississippi River in Pemiscot Co., point on levee about 3.5 mi. north of Cottonwood Point and extends down levee of approx. 3.8 mi., CIVENG 40-041-54-105. CD 5/25/44.

† **Kan., Topeka**—STORAGE FACILITY, etc.—B.A. 5/5—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., ordnance ammunition storage facility, office and ammo shop, small arms warehouse, pyro and chemical bldgs., 8 bay segregated storage bldg., magazine, concrete igloo, roads, Forbes Air Force Base, near here, ENG-23-028-54-61. Capitol Eng. Co., 1243 Topeka Blvd., engr. CD 5/19/52.

(Continued on page 81)

BACK OF THIS PUMP STANDS..

The GORMAN-RUPP Guarantee

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, any time, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

GORMAN-RUPP 125 M PUMP

Designed by experienced pump engineers, built by expert craftsmen, thoroughly tested in the factory and proven in the field.

The Gorman-Rupp is built for long, hard service. The greater capacity when working against high heads is most important. Streamlined inside, no by-passes or valves, no efficiency lost in pumping and a minimum of maintenance insures against loss of time and results in greater profit to the contractor.

Ask for
Contractors' Pump Bulletin No.4-CP-11

Gorman-Rupp Pumps — Solve Your Pumping Problems

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

(Advertisement)

CONTRACTORS LOOK FOR MOST DEPENDABLE PUMP

Contractors are quick to recognize the advantages of having the best equipment possible on construction jobs. Any saving of time in completing a contract is a saving in man hours and also frees his equipment for the next job. Dependable pumps are a necessity on any job that involves drainage or the movement of water.

The Gorman-Rupp Company of Mansfield, Ohio, specializing in pumps only, guarantees that their pumps will out-perform any pump of comparable size and type on the market.

These self-priming centrifugal pumps have long led the field in performance and dependability. The new Gorman-Rupps are the result of years of study and research in the field and in the laboratory.

Gorman-Rupp blue pumps are a common sight on tough pumping jobs everywhere. Their greater capacity when working against high heads, their great simplicity, their trouble-free operation and rugged construction make them a great favorite with contractors.

FIELD NOTES ON THE GORMAN-RUPP DIAPHRAGM PUMP *in a SLAUGHTER HOUSE*

Before the men at a Berlin Heights slaughter house heard about the Gorman-Rupp diaphragm pump, they used to flip a coin to decide which unfortunate individual got the repulsive job of cleaning out the pit into which all of the blood and other waste matter of the slaughter house drained.

The pit was about 8 feet square and 10 feet deep. The liquid was to be pumped into a storage tank which at the time the pump was installed was in the construction stage. This tank would be placed about 30 feet from the pit. The Gorman-Rupp 3D-8R6 diaphragm pump was placed at the side of the pit, making a 10 foot suction lift and a 30 foot discharge.

In order to prove the Gorman-Rupp diaphragm pump's ability to pump the liquid, the discharge hose was curled around and back into the pit. The diaphragm pump handled the liquid and waste materials smoothly, easily, and quickly.

The unit is self-priming and required no attention except supplying of fuel and starting or stopping.

THE GORMAN-RUPP COMPANY
. MANSFIELD, OHIO .

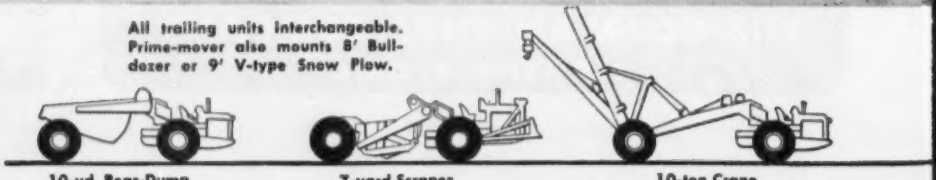
Third pass by 2½-yd. shovel fills bowl. Load time averages 1.25 minutes. Large 7' x 11' bowl provides easy target, reduces spillage.

Replaces 6 trucks with 2 Tournapull Rear-Dumps

Saves thousands of dollars yearly in maintenance costs

122 hp, 28 mph two-wheel "D" powers:

All trailing units interchangeable. Prime-mover also mounts 8' Bull-dozer or 9' V-type Snow Plow.



10-yd. Rear-Dump | 7-yard Scraper | 10-ton Crane

Tournapull Hauler dumps 7-yd. load into grizzly. With electric hoist, bowl can be lifted for full, instant dump or controlled at a reduced angle for slow, precision feeding.

"We used to use 6 trucks to haul sand and gravel from our pit to grizzly," says Carl Darrow, foreman for Valley Sand and Gravel Company, Waukesha, Wisconsin. "The main trouble was that each year we had to spend thousands of dollars on them to replace axle-shafts, rear-ends, transmissions, and broken drive-shafts. Two mechanics had to work full-time to keep the 6 trucks going. Now that we have 2 Tournapull Rear-Dumps in place of the trucks, we need only one mechanic — and he has to put in only about 10 hours a week on both Tournapulls. In this time, he not only handles all repairs . . . but cable changes, grease jobs, and oil changes as well. Mechanical downtime averages only ½ hour per Tournapull Rear-Dump per 80-hour week."

Located in Waukesha County, Wis., Valley Company's pit has been in continuous operation since 1928. Present owners took over in 1948. Pit, now 100′ deep, will be excavated at least another 100′ before plant site is moved. Plant operates about 7 months per year . . . must close when early frosts freeze the wash water. One winter, Tournapull Rear-Dumps excavated two 16,000-yd. settling ponds, each 60′ x 300′ and 20 to 25′ deep. Ponds are now used to reclaim wash water (the company uses 1,000,000 gal. every 8 hours).

2000′ cycle every 4 minutes

In typical performance, Rear-Dump is loaded with 7 bank yards of sand and gravel per load. Speeds average 6 to 12 mph on 1000′ haul, up to 14 mph on 1000′ return. In spite of continuous 6 to 10% adverse grades and several sharp turns, each "D" delivers 14 loads to grizzly per 55-minute hour. Combined hourly production, Darrow estimates, is about 200 cubic yards, or 300 tons.

After 2300 machine hours per unit, Rear-Dump tires are still in very good condition. "Tournapulls can really take it," says Operator John Chase. "We have worked them 24 hours a day for several weeks at a time and never turned off the engines except for refueling. We have very little trouble with them."

Why not investigate high-speed, rubber-tired Tournapull Rear-Dumps? Check facts and figures from other Tournapull owners on work like yours. See how these Rear-Dumps can give you more production at far less cost. Then ask for a demonstration. Where Tournapull Rear-Dumps fit the job, savings in time, cost, and supervision are so important, you owe it to yourself to investigate!

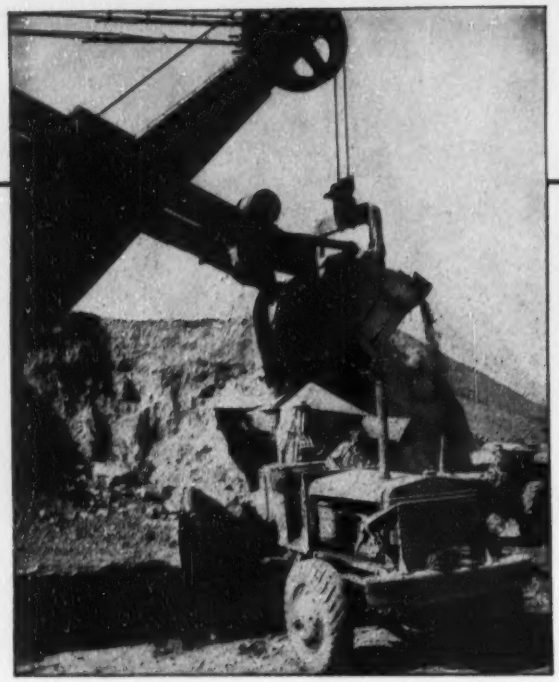
Tournapull—Trademark Reg. U.S. Pat. Off. DR-568-S

Logging Arch

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company



SPECIFICATIONS SHOULD REQUIRE

CONSTRUCTION BONDS

Ask for . . .

NATIONAL SURETY CORPORATION

NEW YORK

one of America's foremost surety companies

INVISIBLE ARMOR

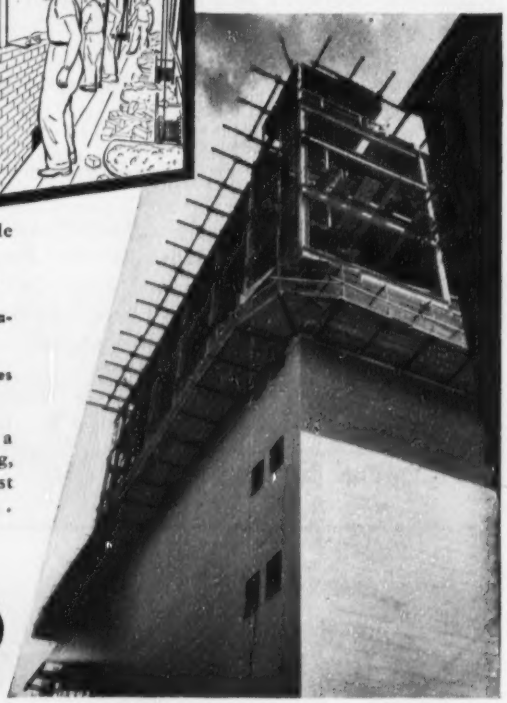
This symbol on your bond or policy guarantees satisfaction.

Lay Bricks Faster . . .

with **GOLD MEDAL** *Safety* **SCAFFOLDING MACHINES**

RENTAL SERVICE— includes inspection and complete overhaul by trained personnel after each job to assure perfect condition at all time.

Write for Catalog showing why contractors use Gold Medal Scaffolds.



On independent-frame buildings, the best suspended scaffolding is Gold Medal. *It will help you to get brick work done faster* . . . as it has for hundreds of other contractors. Available with overhead protection attachments . . . and can be enclosed and heated. Made in standard 5' width and 8-foot "wheeling type".

- **Working platform level is quickly adjusted as work progresses.**
- **Bench-high work increases efficiency.**
- **Listed by Underwriters' Laboratories, Inc.**
- **Positive, automatic locking devices assure maximum safety.**

Remember this: We have *all* types of modern scaffolds. That's a convenience *no other supplier* can offer you. Our stocks of scaffolding, spotted in major cities from coast to coast, are the largest and most complete. *One* source for every type scaffold! *Whatever your job . . . we can scaffold it for you with the* RIGHT *scaffold.*

GOLD MEDAL LADDERS SCAFFOLDING ®

for Greater Safety...Efficiency...Economy

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. ENR. Long Island City 1, New York
West Coast Plant: 6931 Stanford Ave., Los Angeles 1, Calif.

(Continued from page 76)

BIDS ASKED—BUILDINGS

▲ **Neb., Lincoln**—COLLEGE—B.A. 4/27—University of Nebraska, 12 and R Sts., Teachers College High School at University. $1,000,000. L. A. Daly Co., Insurance Exchange, Omaha, engr. CD 1/29.

Tex., Corpus Christie—SHOPPING CENTER—Bids Asked—Ray Peterson, 439 Old Robstown Rd., 1 story masonry shopping center, concrete slab fdn. $350,000. Morris L. Levy, Kaffe Bldg., archt. CD 10/15/52.

SOON LETS CONTRACT—BUILDINGS

Mo., Overland (St. Louis 14 P. O.)—WAREHOUSE, etc.—Fred P. Rapp, 1450 S. Vandeventer Ave., St. Louis, Zone 10, soon lets contract 1 story, brick, steel, concrete, masonry, 100,000 sq. ft. warehouse and office, incl. 8,000 sq. ft. refrigerated area, railroad spur, loading docks, Page Ave. and Walton Rd. $750,000. Rime A. Dusard, 9215 Ladue Rd., Ladue, Zone 24, archt. CD 10/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Meico Inc.**, 1221 Baltimore St., Kansas City, Mo. CA $1,027,000. Water treatment plant, LAWRENCE, KAN. City, Lawrence, Kan. Black & Veatch, 4705 Broadway, Kansas City, Mo., engrs. CD 9/29.

Kansas Constr., Lawrence, Kan. CA $261,854. Contr. 5 water sys. addn., distr. imprvs., LAWRENCE, KAN. City, Lawrence, Kan. Bids Mar. 16. CD 3/4.

Colorado Valley Co-operative, Schulenburg, Tex. Own Forces. $100,000. Some rural pole telephone lines, Schulenburg, Fayette Co., TEXAS.

Vaughn & Taylor Constr. Co., Odessa, Tex., CA $285,000, 100 mi. 2-to 10-in. screw joint gas gathering lines in eight fields, Stonewall Co.; CA $145,000, booster station units in gas supply field lines, Stonewall Co., TEXAS. Stonewall Gas Products Co., Inc., Stonewall, Tex.

Comanche County Telephone Co-operative Assn., Comanche, Tex., Own Forces, $122,500, 100 mi. new pole rural telephone lines, Comanche Co., TEXAS. CD 9/30.

▲ **H. B. Zachry Co., Construction Div.**, Box 2570, San Antonio, Tex., CA, $3,744,000, laying 208 mi. 20-in. welded joint crude oil line, Corsicana to Beaumont, TEXAS. Magnolia Pipe Line Co., Magnolia Bldg., Dallas, Tex. CD 1/25.

Coleman County Electric Co-operative, Coleman, Tex., Own Forces, $100,000, Imprvs., exten. to distr. sys., Coleman Co., TEXAS. CD 12/18.

▲† **Rex D. Kitchens Constr. Co.**, Box 3005, South Austin Station, Austin, Tex., LB, $1,762,000. maintenance hanger, Abilene Air Force Base, Inv. No. Eng.-41-443-54-48. ABILENE, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids Apr. 2. CD 3/15.

Tellepsen Constr. Co., Box 2536, Houston, Tex., LB $203,190, B.I. first lift pump station, Proj. No. 86-A-04; LB $211,270, B.I. second lift pump station, Proj. 86-A-05, BEAUMONT, TEX. Lower Neches Valley Auth., U. S. Hy. 69, Beaumont, Tex. Bids Mar. 25. CD 3/19.

Fretz Constr. Co., Box 18094, Houston, Tex. CA, $717,300, airport terminal, loading fingers, HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Bids Mar. 10, awarded Mar. 29. CD 3/19, under LB.

▲† **J. J. Fritch Constr. Co.**, 6834 Harry Hines Blvd., Dallas, Tex., CA $2,015,612, constr. hospital and facilities, Wolters Air Force Base, Inv. ENG-41-443-54-30. MINERAL WELLS, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids Mar. 11. CD 3/18, under LB.

Valley Acres Irrigation Dist., Santa Rosa, Tex., Own Forces. $125,000. pumping unit, SANTA ROSA, TEX CD 8/30/51.

Valley Acres Irrigation Dist., Santa Rosa, Tex. Own Forces. $245,000. some open earthen irrigation canals, SANTA ROSA, TEX. CD 8/30/51.

† **U. S. Eng.**, P. O. Box 1229, Galveston, Tex., cancelled bids to have been opened Mar. 31, parking areas, sidewalks and drainage, Foster Air Force Base, Inv. No. ENG-41-243-54-68, VICTORIA, TEX. Est. $100,000-$500,000. CD 2/25.

▲ **Hoffman & Borders and Fred Hall & Son**, Box 2096, Waco, Tex., CA $1,566,000. sewage treatment plant remodeling and constr. new structures, Proj. No. 475-2-53, WACO, TEX. City, Waco, Tex. Bids Mar. 26, awarded Apr. 2. CD 3/31, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

E. A. Brunson Constr. Co., 4052 Forest Park Blvd., St. Louis 8, Mo. CA 2 story, 63x120 ft., brick, rein.-con., masonry GYMNASIUM and LAUNDRY, O'FALLON, MO. St. Mary's Institute, Sisters of the Most Precious Blood, O'Fallon, Mo. Maguolo & Quick, 4908 Delmar Blvd., St. Louis 8, Mo., archts. Bids Feb. 19.

▲ **MacDonald Constr. Co.**, 1310 S. Grand Blvd., St. Louis 4, Mo. LB $4,312,000, general contract;

Tobin Brothers, Inc., 708 N. Adams St., Peoria, Ill., LB $643,000, plumbing contract;

Kremer-Hicks Co., 3974 Delmar Blvd., St. Louis 8, Mo. LB $846,000, heating contract;

J. Livingston & Co., 4857 Goodfellow Blvd., St. Louis, Mo. LB $361,266, electrical contract for HOUSING Proj. MO-1-7, Phase I consisting of 660 dwelling units in four 9 story bldgs. on 16 acres in area bounded by Lafayette Ave. Hickory 12 and 14 Sts., ST. LOUIS, MO. St. Louis Housing Auth., John J. O'Toole, exec. dir., 901 Washington Ave., St. Louis 1, Mo. Bids Mar. 30. CD 2/24.

Rich Bros. Constr. Co., 7649 Delmar Blvd., University City 5, Mo. CA Est. $300,000. five 2 story, 49x95 ft. brick DWELLINGS. 1 to 5 Delcrest Court, ST. LOUIS COUNTY, MO. Mamie Rich, 7736 Gannon St., University City 5, Mo.

WHICH OF THESE CHARACTERISTICS ARE ESSENTIALS ON YOUR REMOTE CONTROL JOBS?

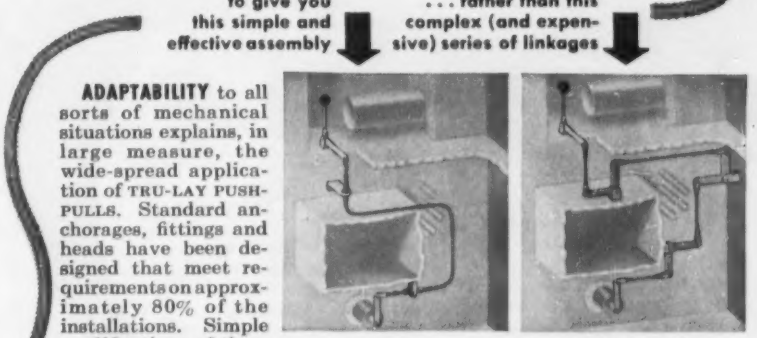
Accuracy . . . High Load Capacity . . . Adaptability . . . Freedom from Trouble . . . Long Life . . . Flexibility . . . these are some of the qualities of **ACCO TRU-LAY PUSH-PULL FLEXIBLE CONTROLS** that have made it possible to improve the operation of literally hundreds of mechanical products (list on request). Full description of this versatile REMOTE CONTROL is given in our **DATA FILE** available for your further study.

ACCURACY is inherent in the basic design, and in the standards of quality and precise dimension that control the manufacture of TRU-LAY PUSH-PULL CONTROLS. These are precision products, not gadgets.

VERSATILITY of this fine remote control can best be illustrated by citing some of the jobs it handles well . . . **HOT** jobs on jets and industrial furnaces . . . **COLD** jobs down to —70° F. . . . **WET** jobs (the conduit can be completely immersed) . . . **DIRTY** jobs . . . **ABRASIVE** jobs . . . **CORROSIVE** jobs . . . **HEAVY, TOUGH** jobs up to 1,000 lbs input . . . **LIGHT DUTY** jobs . . . **REMOTE** jobs 150 feet or more from the control point . . . these units are frequently and successfully used in conjunction with electric, hydraulic and air controls . . . are thoroughly effective under almost any operating condition.

"SOLID as a rod but FLEXIBLE as a wire rope" aptly describes TRU-LAY PUSH-PULL CONTROLS. This *flexibility* provides positive, remote action whether anchorages are fixed or movable . . . it damps out noise and vibration—protects delicate instruments . . . it permits ease of handling and shipping even when assemblies are 100 or 150 feet long . . . it avoids the risk of damage always present with solid tubular controls that must be preformed to position . . . and flexibility greatly simplifies installation of controls by reducing the number of working parts and by making it possible to snake around obstructions. . .

to give you this simple and effective assembly ⬇ **. . . rather than this complex (and expensive) series of linkages** ⬇



ADAPTABILITY to all sorts of mechanical situations explains, in large measure, the wide-spread application of TRU-LAY PUSH-PULLS. Standard anchorages, fittings and heads have been designed that meet requirements on approximately 80% of the installations. Simple modifications of these standards, or minor changes in your own design, cover almost every special situation. Our engineers have the know-how on such matters.

FREEDOM FROM TROUBLE and **LONG LIFE** are assured even under exceptionally adverse operating conditions because of such things as . . . full protection of the flexible, inner, working member by the tough flexible conduit . . . lubrication of the inner, working member *for life* during assembly . . . seals that keep moisture, dust and other foreign matter out of the unit . . . cold swaging of fittings that makes them integral parts of the control unit. (Full construction details in our **DATA FILE**). We have never heard of a TRU-LAY FLEXIBLE PUSH-PULL CONTROL wearing out in normal service.

Whether your interest is in a single application of this versatile PUSH-PULL CONTROL, or in its inclusion as a component of the product you manufacture, the six booklets and bulletins in this **DATA FILE** will answer your further questions, and will also provide you with the means of defining to us the application you may be interested in.

DATA FILE

ACCO ***WRITE for a copy, without obligation***

TRADE MARK

AUTOMOTIVE and AIRCRAFT DIVISION
AMERICAN CHAIN & CABLE

601-F Stephenson Bldg., Detroit 2
2216-F South Garfield Ave., Los Angeles 22 • Bridgeport 2, Conn.

▲ **Jones-Hettelsater Constr. Co.**, 1911 Baltimore St., Kansas City, Mo. CA $1,200,000. GRAIN ELEVATOR addn., KANSAS CITY, KAN. Hart-Bartlett & Sturtevant Grain Co., Bd. Trade Bldg., Kansas City, Mo.

▲ **Ridgewood Development, Inc.**, 219 N. Market St., Wichita, Kan. Owner Builds. $2,530,000. 230 RESIDENCES, WICHITA, KAN. Lawrence E. Wells, 1806 E. 13 St., Wichita, Kan., archt.

Troy Jones, 3410 Fillmore St., Amarillo, Tex., Owner Builds, $300,000. TOURIST COURTS, 10-acre site, AMARILLO, TEX. CD 7/22.

George A. Schuler, Jr., 2315 Portsmouth St., Houston, Tex., Own Forces. $321,500, 12 DWELLINGS, HOUSTON, TEX. CD 1/25.

▲ **Corrigan Constr. Co.**, Mercantile Bank Bldg., Dallas, Tex., CA $1,250,000. SHOPPING CENTER, Washington St. east of Shepherd Dr., HOUSTON, TEX. Leo F. Corrigan, Mercantile Bank Bldg., Dallas, Tex. Prinz & Brooks, 1330 N. Industrial Blvd., Dallas, Tex., archts. CD 1/10/52.

Larry Nierth, 4503 Staunton St., Houston, Tex., Own Forces. $305,000, 10 brick DWELLINGS, concrete slab fdn., $358,750, 12 brick, stone, DWELLINGS, concrete slab fdn., HOUSTON, TEX. CD 1/27.

▲ **BMFP Constr. Co.**, 2110 Avenue A, Lubbock, Tex., LB, $1,824,765, AUDITORIUM-COLISEUM, LUBBOCK, TEX. City, Lubbock, Tex. Bids Apr. 2. CD 3/25, under Unclassified.

▲ **Corrigan Constr. Co.**, Mercantile Bank Bldg., Dallas, Tex., CA. Approx. $1,000,000. Corrigan SHOPPING CENTER addn., PASADENA, TEX. Leo F. Corrigan, Mercantile Bank Bldg., Dallas, Tex. CD 1/20.

Texas Power & Light Co., Interurban Bldg, Dallas, Tex. Own Forces. $175,000. TERMINAL for equipment and general storage; $200,000, some remodeling and expansion of main electric power plant, SHERMAN, TEX. CD 12/16 and 12/8.

▲ **C. H. Leavell & Co.**, 1900 Wyoming St., El Paso, Tex., LB, $1,895,994, est. $2,000,000. 4 story, central core with 2 story side wings, rein.-con., brick, stone, State Highway OFFICE bldg., Colorado Blvd. and Louisiana Ave., DENVER, COLO. Colorado State Highway Dpt., 518 State Office Bldg., Denver, Colo. Bids Mar. 24. CD 2/26.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Ore., Salem**—GERIATRICS—B.A. 4/30—Oregon Bd. Control, Capitol, Salem, 5 story, rein.-con. geriatrics addn. to state hospital. $1,500,000. Extended date. Hollis Johnston, Concord Bldg., Portland, archt. CD 1/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Bay Constr. Co.**, 1762 Airport Way, and **Don L. Cooney**, 1749 Airport Way, Seattle, Wash., LB, $947,-2.2, Mc Nary Powerhouse Lines 3 and 4 and Mc Nary-Washram Section, Mc Nary-Ross 345-kv line, 91.9 miles, Klickitat and Umatilla Counties, Inv. 7286, WASHINGTON and OREGON Booneville Power Admin., 827 N.E. Oregon St., Portland, Ore. Bids Mar. 25. CD 3/5.

▲† **Guy F. Atkinson Co.**, Box 259, Long Beach, Calif., LB, $1,562,650, Los Angeles River Channel Imprvt. 7 to 20 Sts., Long Beach, Los Angeles Co., CIVENG-04-353-54-30, CALIFORNIA U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 30. CD 3/5.

▲ **Jerry Artukovich & N. A. Artukovich Constr. Co.**, 723 Union Ave., Montebello, Calif., LB, $1,341,759 sanitary sewer Phase II and III, REDONDO BEACH, CALIF. City, 122 Emerald St., Redondo Beach, Calif. Bids Mar. 29. CD 3/12.

BUILDINGS

LOW BIDS AND CONTRACTS

Geo. H. Buckler Co., 4235 S.E. 17 St., Portland, Ore., CA, $275,000, 6 concrete GRAIN-STORAGE BINS, HELIX, ORE. Helix Milling Co., Helix, Ore. Awarded Mar. 30.

▲ **Darwood Corp.**, 800 W. Olympic Blvd., Los Angeles, Calif., Owner Builds, $1,388,400. 156 frame, stucco DWELLINGS, Dunrobin Ave., Muroc Ave., Ocava Pl., DOWNEY, CALIF. Wm. H. Bray, 962 N. La Cienega St., Los Angeles, Calif., engr.

▲ **The Vinnell Co., Inc.**, 1145 Westminister Ave., Alhambra, Calif., LB, $1,270,000, WAREHOUSE at Palmdale Airport, PALMDALE, CALIF. North American Aviation, Inc., 5601 W. Imperial Hy., Inglewood, Calif. Bids Mar. 30. 3/29.

▲ **Cahill Brothers, Inc.**, 350 Sansome St., San Francisco, Calif., LB, $1,298,283, MEN's DORMITORY SAN FRANCISCO, CALIF. University of San Francisco, 2130 Fulton St., San Francisco, Calif. CD 5/13.

CANADA

BIDS ASKED—BUILDINGS

▲ **Que., Bouchard**—MAGAZINES—Bids Asked—Defense Constr., (1951) Ltd., 56 Lyon St., Ottawa, Ont. thirty-five 36x102 ft., magazines, $2,000,000. Plans deposit $100. Extended date. Beauchemin & Hurter, 1117 St. Catherine St. W., Montreal, engrs. Rule, Wynn & Rule, 11422 Jasper Ave., Edmonton, Alta., archts. CD 2/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **A. Robertson, Ltd.**, 5035 Western Ave., Montreal, Que., CA, Est. $5,000,000, ore dock, dredging, etc. CONTRECOEUR, QUE. Iron Ore Co. of Canada Ltd., 810 Cote de Liesse Rd., Montreal, Que. Bids Mar. 9. CD 3/2.

BUILDINGS

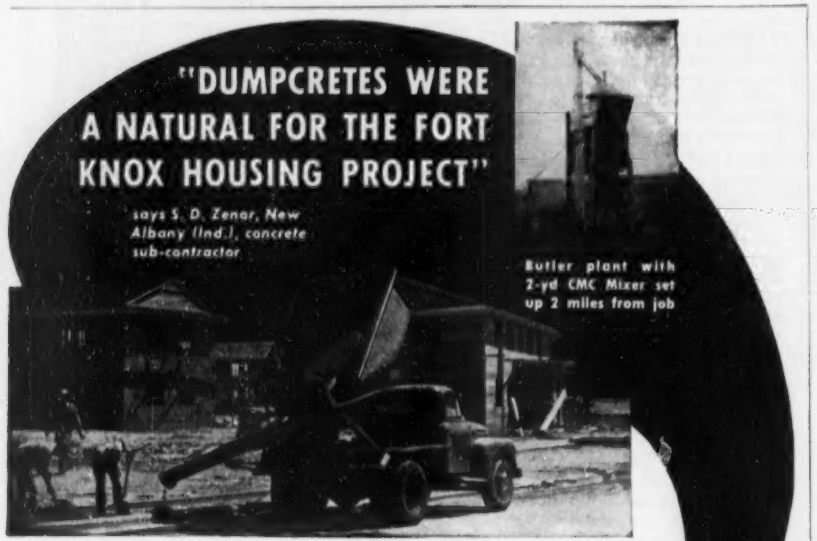
LOW BIDS AND CONTRACTS

Hill-Clark-Francis Ltd., 190 Pine St., Timmins, Ont., CA, $467,636, 3 wings, 2 story, concrete, steel HOME for the AGED, TIMMINS, ONT. Municipality, City Hall, Timmins, Ont. Bids Mar. 24. CD 3/2.

F. Frenette Ltd., 75 St. Laurent Ave., Quebec City, Que. CA, $399,000, 75x180 ft., concrete, stone CHURCH, Paradis St., STE. FOYE, QUE. Roman Catholic Parish of St. Thomas Aquinas, 2145 Ste. Foye Rd., Ste. Foye, Que. P. Cote, 19 Bon Air Ave., Ste. Foye, Que., archt.

Steinberg's Groceteries Ltd., 5400 Hochelaga St., Montreal, Que. Owner Builds, $300,000. SUPERMARKET, West Sherbrooke St., WESTMOUNT, QUE.

Poole Constr. Co., Ltd., Hamilton St., Regina, Sask., CA, $500,000, concrete, steel, brick PARTS PLANT, REGINA, SASK. Chrysler Corp. of Canada Ltd., Windsor, Ont. Rule & Assocs., 11422 Jasper Ave., Edmonton, Alta., archts. W. R. Souter & Assocs., 36 James St., Hamilton, Ont., archts. CD 3/24.



"DUMPCRETES WERE A NATURAL FOR THE FORT KNOX HOUSING PROJECT"

says S. D. Zenor, New Albany (Ind.), concrete sub-contractor

Butler plant with 2-yd CMC Mixer set up 2 miles from job

"32,000 yards is a lot of concrete," says Mr. Zenor, "especially when you make your pours in close quarters."

"We liked our four Dumpcretes for these tight spots, because they are light and easy-to-maneuver. With the high discharge and long chute we placed concrete direct . . . for foundations, porches, steps, sidewalks and parking areas. They were fast, too, and maintenance was nil."

Algernon Blair and Fort Knox Construction were contractors on the 1500-unit projects.

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Fastest from plant to pour

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689 Talbott Bldg., Dayton 2, Ohio

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Firm_____

Street_____

City_____ State_____

Proposed Projects

WATER SUPPLY

N. Y., **Greenburgh**—Town Council, imprv. water supply facilities, incl. a tap to new Delaware River Aqueduct. $960,000. CD 1/21/54.

▲ **Tex., Dallas**—Metropolitan Water Dist. (Dallas-Tarrant Counties), c/o John W. Daugherty, Grand Prairie, water booster plant, at Dallas, $300,000; water booster plant, near Fort Worth, $350,000; 21 mi. water mains between Fort Worth-Dallas, $750,000; 15 mi. water mains between Dallas-Fort Worth, $550,000. Forrest & Cotton, 803 Praetorian Bldg., Dallas, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Va., Richmond**—City, City Hall, sewage treatment facilities, interceptor lines, $875,000; sanitary and storm sewers, $537,000. Horace H. Edwards, c/o owner, city mgr. CD 6/13/51.

BRIDGES

▲ **NEW JERSEY and PENNSYLVANIA**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, N. J. and Pennsylvania Turnpike Auth., 11 N. 4 St., Harrisburg, Pa.

bridge over the Delaware River linking N. J. and Pa. Turnpikes, $10,000,000; 6 mi. approach road in New

(Continued on page 84)

HEARD THE LATEST?

THE BLAW-KNOX *"Complete Package"*

NOW CONTAINS EVERYTHING YOU NEED FOR...

PAVING HIGHWAYS AND AIRPORTS

is a highly profitable operation with the Blaw-Knox "Complete Paving Package." It consists of Clamshell Buckets, Aggregate and Cement Batching Plants, Self-Aligning Road Forms, Precision Subgraders, MultiFoote Pavers, Concrete Spreader and Finishing Machines.

READY-MIX OPERATIONS

show greater profit with the Blaw-Knox one-source "Complete Ready-Mix Package." It includes Aggregate and Cement Batching Plants, famous Hi-Boy Trukmixers, Clamshell and Concrete Buckets, Truck Mixer Loading Plants, Central Mixing Plants and Steel Forms.

PAVING BASE COURSE

is fast and economical with this big capacity Blaw-Knox Base Paver which lays stone, slag, gravel, soil cement or crusher run aggregates up to 400 tons per hour in depths up to 20" and widths up to 16'. V-type hopper and oscillating screed prevent segregation. There's ample traction for the softest going and plenty of power to push your truck. Operating costs are low. Two sizes available to fit every job.

PROFITABLE WIDENING JOBS

are assured with these time and labor saving Blaw-Knox Road Wideners. They handle concrete, asphaltic concrete and any kind of aggregate *without forms* to cut costs. Speedy, efficient operation spreads and finishes concrete up to 1½ miles per day . . . builds earth shoulders at a 200 ton per hour clip. Two models are available to handle widths from 2 to 10 feet.

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BLAW-KNOX EQUIPMENT DIVISION
Pittsburgh 38, Pa.
Offices in Principal Cities
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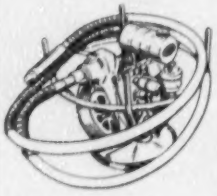
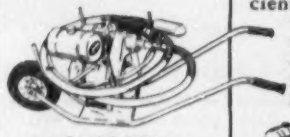
BLAW-KNOX

Concrete facts about Concrete Vibrators and Screeds

Model BU



Model BG



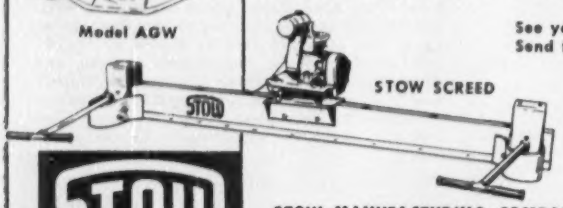
Model AGW

STOW is the name you want!

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speeds operations, cut costs. And STOW design provides convenient practical speed control so *attachments may be used directly on the vibrator shafts.*

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

See your STOW distributor. Send for free Bulletin 526.



STOW SCREED

STOW

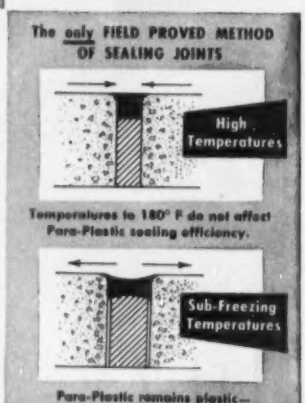
STOW MANUFACTURING COMPANY
19 Shear Street Binghamton, New York

STOP JOINT SEAL FAILURES!

Use HOT-POURED *Para Plastic*

- *Para-Plastic keeps joints sealed under severest conditions of traffic, temperature*
- *May be pumped directly into joint from melting kettle*
- *Para-Plastic "JF" compound impervious to Jet Fuel or petroleum solvents used in aircraft*

Use Hot Poured Para-Plastic . . . field-proved to be the only effective method of sealing joints with a high degree of permanence. There's no substitute for Para-Plastic . . . nothing equals its sealing performance. It's stable, constant in volume, won't break down and maintains bond under virtually every condition. Para-Plastic can now be pumped directly into the joint from the melting kettle—a fast, simple method of application. Write for details on new method and information on Para-Plastic and Para-Plastic JF.


The only FIELD PROVED METHOD OF SEALING JOINTS
High Temperatures
Temperatures to 180° F do not affect Para-Plastic sealing efficiency.
Sub-Freezing Temperatures
Para-Plastic remains plastic—maintains bond at 0° F.

SERVICISED PRODUCTS CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

(Continued from page 82)

Jersey, $9,000,000; 2 mi. approach road in Pennsylvania, $3,000,000. Howard, Needle, Tammen & Bergendoff, 55 Liberty St., New York, N. Y., general consultants, George S. Richardson, Park Bldg., Pittsburgh, Pa., consult. engr. for bridge. CD 4/5/51.

STREETS AND ROADS

▲ **MASSACHUSETTS**—Massachusetts Turnpike Auth., 80 Boylston St., Boston, plans 123 mi. superhighway crossing state from East to West. $240,000,000. Howard, Needles, Tammen & Bergendoff, 55 Liberty St., New York, N. Y., engineers to Authority. Charles T. Main, Inc., 80 Federal St., Boston, The Clarkeson Engineering Co., Inc., 285 Columbus Ave., Boston, Fay Spofford & Thorndike, 11 Beacon St., Boston, C. A. Maguire & Assoc., 14 Court Square, Boston, Zone 8, Hayden, Harding & Buchanan, 662 Park Square Bldg., Boston, Zone 16, Thomas Worcester, Inc., 85 State St., Boston, Zone 9, consult. engrs. DeLeuw, Cather & Co., 150 N. Wacker Dr., Chicago 6, Ill., and Coverdale & Colpitts, 120 Wall St., New York, N. Y., made traffic survey. CD 3/17/52.
O., Youngstown—City, Frank X. Kryzan, mayor, City Hall, widen Oak St. from Monroe St. to Early Rd. $960,000. Clancy-Carle-McFarland, 1506 Market St., consult. engrs. CD 11/6.
▲ **RHODE ISLAND**—State P. Wks. Dpt., State House, Providence,
Glocester—4.5 mi. Mt. Hygea Rd., Hartford Pike to Putnam Pike, $180,000.
Glocester-Scituate—3 mi. Sawmill-Elmdale-Pole Bridge Rds., $150,000.
Hopkinton—6 mi. Nooseneck Hill Rd. to County Trail, north of Division St., $4,500,000.
Johnston—1.3 mi. highway, $230,000.
Narragansett—1.3 mi. Galilee Escape Rd., $223,000.
Newport—highway, Bath Rd. $100,000.
North Kingstown—1 mi. Davisville Rd. to South County Rd. $47,000.
Scituate-Foster—3.6 mi. Central Pike. $160,000.
Westerly—4.5 mi. Bradford Rd. $250,000.
▲ Va., Hampton—City, City Hall, street imprvs., paving, curb and gutter, sidewalks and other work. $4,000,000. William S. Coburn, c/o owner, city mgr.

LATIN AMERICA

▲ Ecuador—Republic of Ecuador, Quito, plans airports at Quito and Guayaquil. $4,800,000. Airways Engineering Corp., 1212 18th St. N.W., Wash. 6, D. C., U. S. A., will design and supervise construction. CD 1/13.

PUBLIC BUILDINGS

▲ Calif., San Francisco—WORLD TRADE CENTER—State Harbor Comm., Ferry Bldg., World Trade Center in Ferry Bldg. $2,010,000. CD 1/53, under Commercial Buildings.
▲ Mich., St. Clair Shores—SCHOOL—City, Lakeview School Dist., voted $1,000,000 bonds Mar. 22, high school. H. E. Beyster & Assocs., Inc., 2000 Industrial Bank Bldg., Detroit, archt. CD 2/25.
▲ Minn., Edina (Minneapolis P.O.)—SCHOOLS—Bd. Educ., M. H. Kuhlman, supt., voted $2,475,000 bonds Mar. 23, junior high school, $2,090,000, grade school, addn., $350,000, site acquisition for future grade school. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 3/9.
▲ Minn., Luverne—SCHOOL—Bd. Educ., E. P. Piepgras, clk., voted $1,520,000 bonds Mar. 26, Junior-Senior high school, $1,300,000 remodeling present high school into grade bldg. H. H. Swanson, 500 Sexton Bldg., Minneapolis, archts. CD 2/10.
▲ Mont., Bozeman—RESIDENCE HALL—Montana State College, Bozeman, plans by Cushing & Terrell, 1333 N. 27 St., Billings, women's residence hall. $1,300,000. CD 3/4.
▲ Mont., Missoula—SCHOOL—Missoula Co. High School, high school. $2,700,000.
▲ N. Y., Long Island City—HIGH SCHOOL—Bd. Educ., 49 Flatbush Ave. exten., Brooklyn, Zone 1, plans by Chapman, Evans & Delehanty, 50 Broadway, New York Zone 4, Proj. E-324, High School of Aviation Trades, 35 St. and Queens Blvd. $6,250,000. CD 7/11/52.
▲ N. Y., Roslyn Heights—HOUSING—Town of North Hempstead Housing Auth., Pond Hill Rd., Manhasset, slum clearance housing. $1,250,000.
▲ Pa., West Point—SCHOOL—Upper Gwynedd School Dist., West Point, plans by John S. Carver, 2112 Spruce St., Phila., elementary school. $1,000,000. Robert E. McLaughlin, 1411 Walnut St., Phila., consult. engr. Eggly Furlow Engineers, 1500 Walnut St., Phila., structural engrs. CD 2/4.

COMMERCIAL BUILDINGS

▲ Calif., Garden Grove—DWELLINGS—Bob Smith, 527 Via Lido, Newport, plans by L. C. Major & Assocs., 11015 S. Paramount Blvd., Downey, 126 frame, stucco dwellings in Tract 2148. $1,000,000.
▲ Conn., Bridgeport—HOSPITAL—Bridgeport Hospital, Grant St., plans by Charles Wellington Walker, 114 State St., hospital bldg. $2,000,000. CD 4/9/52.
▲ Fla., Miami—HOTEL—Dupont Plaza Inc., 5040 Biscayne Blvd., plans by John E. Petersen & Frank H. Shufin, Roper Bldg., hotel, $3,000,000.

(Continued on page 86)

"CENTURY." PIPE

is made from asbestos fiber and portland cement—two almost indestructible materials. Being non-metallic it *cannot* tuberculate. Through generations of service its bore stays clean and smooth. Friction remains at a minimum, pumping costs stay low.

Consider the many other distinct advantages of "Century" pipe and you'll see why more and more thrifty towns are choosing it—why it's the wise choice for your community, too!

Write for further information now.

non-tuberculating

QUALITIES THAT MAKE "CENTURY" PIPE ECONOMICAL, TROUBLE-FREE, LONG-LIVED

1. NON-TUBERCULATING
2. NON-CORROSIVE
3. EXCEPTIONALLY STRONG
4. DURABLE
5. IMMUNE TO ELECTROLYSIS
6. TIGHT JOINTS
7. SMOOTH BORE
8. EASILY, QUICKLY LAID
9. LIGHT WEIGHT
10. LOW COST

"Century" pipe meets the A.W.W.A., A.S.T.M. and Federal Specifications for asbestos-cement pressure pipe.

"Century" pipe awaiting installation along U.S. Route 1 — part of an 8000 ft. water supply line, 12" Class 150 pipe, from the Borough of Media Water Works to Middletown Township, Pa.

See us at the A.W.W.A. Annual Convention, May 23-28, 1954 • Booths 5 and 6 • Civic Auditorium, Seattle, Wash.

KEASBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos

Nature made asbestos . . . Keasbey & Mattison has made it serve mankind since 1873

McKIERNAN-TERRY SINGLE-ACTING PILE HAMMERS

MK333

- The most modern design of single-acting pile hammer on the market, based on more than half a century of specialized experience
- Specially designed for driving into very dense substances such as clay, hard pan, compacted gravel, etc. and for driving heavy mass piles
- Built in a range of 5 sizes.
- All parts completely enclosed for protection against grit, dirt and damage, and for safety
- The only single-acting pile hammers that can perform underwater work
- Many exclusive features for most effective blows, convenient operation and maintenance, and long wear. **Write for Catalog**

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13 PARK ROW, NEW YORK 38, N. Y.

Plants at Dover, N. J. and Harrison, N. J.

• Also builders of coal and ore bridges, bulk material unloaders and specially designed machinery.

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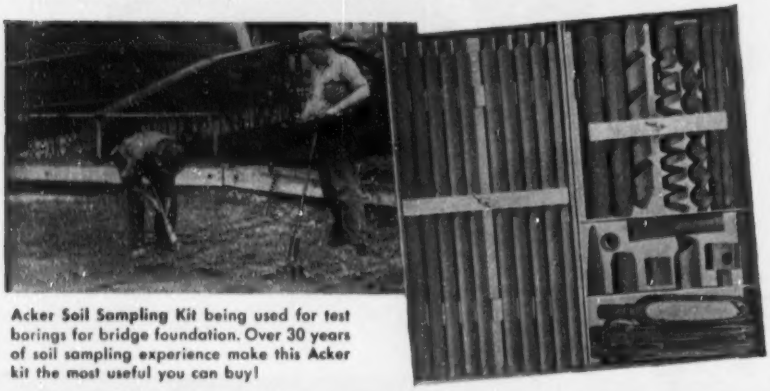
DON'T GUESS!

use an ACKER SOIL SAMPLING KIT for accurate sub-surface information

With accurate sub-soil information, *you avoid* costly trouble later on. And, what better way to get this information than with a portable, easy to use Acker Soil Sampling Kit. For here is a versatile collection of twelve soil sampling tools packed in a handy steel kit that can be carried in any car.

Write today for prices and Bulletin 26, ENR.



Acker Soil Sampling Kit being used for test borings for bridge foundation. Over 30 years of soil sampling experience make this Acker kit the most useful you can buy!

ACKER DRILL CO., Inc. 725 W. Lackawanna Avenue Scranton, Penna.

a complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

(Continued from page 84)

▲ **Ind., Indianapolis**—SHOPPING CENTER—L. S. Ayres & Co., 1 W. Washington St., Indianapolis, Ind., and Landua & Perlman, 110 S. Dearborn St., Chicago, Ill., 45-store shopping center, 62 and Keystone Ave. in northeastern Indianapolis between Broad Ripple and Fort Benjamin Harrison. **$7,000,000.** The Victor Gruen Assocs., 1905 Industrial Bank Bldg., Detroit, Mich., consult. engrs.-archts.

▲ **Ky., Louisville** — SHOPPING CENTER — Marshall Realty Co., St. Matthews, plans by Sidney H. Morris & Assoc., 134 N. LaSalle St., Chicago, Ill., shopping center, incl. stores in U-shaped with parking space, Shelbyville Rd., near here, **$1,000,000,** Jacob Gross Inc., 25 Exchange St., Rochester, N. Y., lessee.

▲ **Mass., Boston**—CLASSROOM—Emmanuel College, 400 Fenway St., plans by Maginnis & Walsh, 126 Newbury St., masonry classroom bldg., Riverway. **$1,250,000.**

▲ **Minn., Minneapolis**—BANK—Federal Reserve Bank, Ninth District, O. S. Powell, pres., Fifth St. and Marquette Ave., plans by Larson & McLaren, 1901 Foshay Tower, constr. up to 8 stories bank on top of present bank. **$1,000,000.**

▲ **N. Y., Brooklyn**—DORMITORIES, etc.—Pratt Institute, 255 Ryerson St., two dormitories, classroom bldg. and college union bldg. on campus. **$1,750,000.** CD 5/20/52.

▲ **N. Y., New York**—APARTMENTS—Berne Constr. Ct., Inc., 111 E. 56 St., Zone 22, plans by Maxon, Sells & Ficke, 724 Fifth Ave., Zone 19, two 20 story apartments, 408-418 W. 57 St. and at 442-446 W. 57 St. **$3,000,000.**

▲ **N. Y., New York**—APARTMENT—35 Park Ave., Inc., c/o Sylvan Bien, archt., 565 Fifth Ave., Zone 17, 18 story apartment, 25-37 Park Ave., southeast corner of E. 36 St. **$2,500,000.**

▲ **O., Youngstown**—APARTMENT—Advanced Development Co., c/o David Haynes, atty., Wick Bldg., apartment proj. for 300-families, two story brick bldgs., on 22-acre site north of North Side Hospital, on Colonial Dr. between Fifth Ave. ext. and the hospital standpipe, in Liberty Twp. **$3,500,000.**

▲ **Ore., Salem**—STORE—J. J. Newberry Co., 600 S. W. 5 St., Portland, 100x165 ft., bsmnt. department store. $3,000,000.

▲ **Pa., Jenkintown**—SHOPPING CENTER—Owner c/o Aaron Colish, archt., 117 S. 17 St., Phila., shopping center (8 stores), offices and parking area. **$3,500,000.**

▲ **Pa., Phila.**—APARTMENT—George Friedland, 2223 E. Allegheny Ave., plans by Boak & Raad, 175 Fifth Ave., New York, N. Y., 13 story apartment, 19 and Race Sts. **$10,000,000.** Thalheimer & Weitz, 1325 Walnut St., assoc. archts.

▲ **Pa., Phila.**—OFFICE—Pennsylvania Lumbermen's Mutual Insurance Co., Market St. Natl. Bank Bldg., plans by Thalheimer & Weitz, 1325 Walnut St., converting Ritz-Carlton Hotel into 17 story office. **$5,000,000.** CD 5/18/51.

▲ **Pa., Phila.**—APARTMENT—Bernard Weinberg, Hardt Bldg., plans by Philip Birnbaum, 12 E. 48 St., New York, N. Y., apartment, East River Dr. **$5,500,000.**

S. D., Sioux Falls—DORMITORY—Augustana College, 29 and Summit Sts., dormitory. **$675,000.**

▲ **Tenn., Memphis**—APARTMENT—Kemmons Wilson, 4985 Summer Ave., plans by John H. Doggett, Medical Arts Bldg., 10 story apartment, Approx. **$2,000,000.**

▲ **Tex., Houston**—BUILDING ANNEX—South Coast Life Insurance Co., Houston Title Bldg., 20 story building annex. **$2,750,000.**

▲ **Que., Montreal**—OFFICE, etc.—Harry Cohen, 1113 Castle Bldg., 1410 Stanley St., plans by A. Schrier, 4147 Sherbrooke St. W., 4 story, rein.-con., porcelain enamel exterior finish store and office bldg., air-conditioning, Sherbrooke St. W. and Prudhomme Ave. **$1,000,000.**

INDUSTRIAL BUILDINGS

▲ **Colo., Denver**—PLANT—Pacific Can Co., 290 Division St., San Francisco, Calif., 62,500 sq. ft., brick, steel can mfg. plant. **$2,000,000.**

▲ **O., Brook Park**—WAREHOUSE—Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, 1 story masonry warehouse to store tires and other products, Eastland and Holland Rds. **$3,000,000.**

▲ **O., Cleveland**—FACTORY—Electric Controller & Mfg. Co., 2700 E. 79 St., Zone 4, plans by Arthur E. Rowe & Assocs., 1743 E. 25 St., Zone 14, 1 story, 353x603 ft. masonary factory, 4480 Lee Rd. **$3,000,000.**

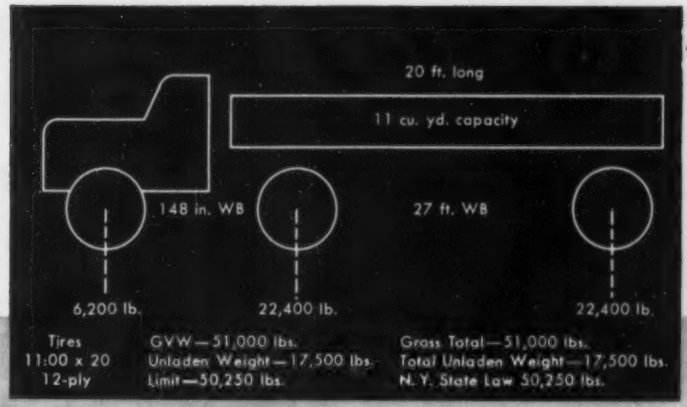
▲ **Tex., Houston**—PLANTS—Phillips Chemical Co. (subsidiary of Phillips Petroleum Co.), City Natl. Bank Bldg., ethylene plant, **$3,750,000;** some warehousing in connection polyethylene plant, **$250,000;** repair shop unit, **$175,000;** polyethylene plant, trademark will be "Marlex 50", **$6,500,000,** inside owners, 1,100 acre Industrial tract on Ship Channel.

UNCLASSIFIED

▲ **Calif., San Francisco** — TERMINAL — State Harbor Comn., Ferry Bldg., terminal constr. at Piers 15 and 17, **$2,160,000;** public garage between Ferry Bldg. and Pier 1, **$1,200,000.** CD 1/22/46.

▲ **Minnesota and Wisconsin**—NATURAL GAS PIPE LINE—Northern Natural Gas Co., 2223 Dodge St., Omaha, Neb., 167 mi. natural gas pipe line from Farmington, Minn. to Duluth, Minn. and Superior, Wis. **$12,195,300,** M. C. Madsen, c/o owner, ch. engr. CD 10/9/52, under Texas.

PAYLOAD diagram tells why Colonial's fleet of Whites pays off. Here is weight distribution on Model WC22PLT White with Marion Cable 11-yd. Dumper.



Colonial Sand & Stone Co., Inc., New York, tells how

FLEET OF WHITES

boosts payload

...reduces trip time

GET THE FACTS about the advantages of White Payload Design for your business—it pays off in extra payload, first day in service, and counts up to an amazing annual savings.

The diagram above shows how Colonial Sand & Stone Co., Inc., cuts down trip time, improves customer service because of the maneuverability and versatility of this unit and boosts payload.

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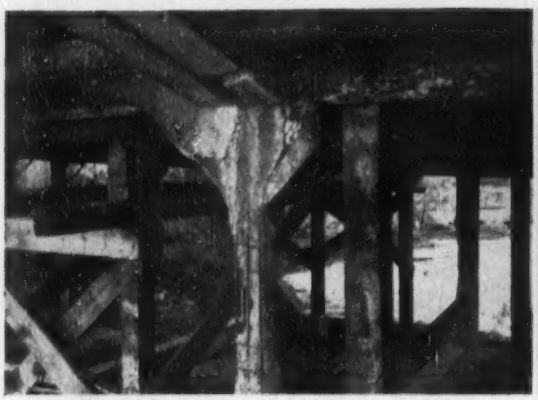
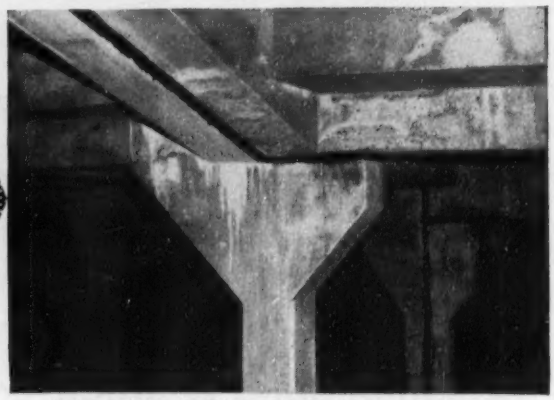
ERIE'S CONDEMNED VIADUCT RESTORED IN RECORD TIME WITH $75,000 SAVINGS



Concrete in Erie viaduct was crumbling and honeycombed.



After Prepakt repairs, Erie has stronger-than-new structure.

● The West 6th Street Viaduct had always been a "headache" for the city of Erie (Pa.). Soon after completion in 1925, it required shoring up. By 1952 rapid deterioration of concrete structural members caused it to be closed to traffic.

With cracked, honeycombed columns and a badly disintegrated deck, it was near collapse. Rebuilding, although costly, seemed the only solution until Intrusion-Prepakt suggested a rehabilitation plan using its fast, low-cost method.

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Consulting Engineer: Joseph G. Conrath

To make the bridge *stronger than new* (from H-12 to H-20), a new Prepakt Concrete girder beam was added on the longitudinal centerline. This beam and its columns are supported by cast-in-place Prepakt Concrete piles.

Erie's bridge was reopened *28 days ahead of schedule*—some five months earlier and $75,000 cheaper than with any other method.

Once again Prepakt lived up to its claim: "If it's still standing, we can repair it"!

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 19 Connecticut
STREETS AND ROADS
April 20 Massachusetts

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Wes Julian Constr. Corp.,** 850 Providence Hy., Dedham, Mass. CA **$3,885,917,** est. $5,000,000. airfield pavements, utilities Hanscom Air Force Base, ENG-19-016-54-25, BEDFORD, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Whitman & Howard, 89 Broad St., Boston, Mass., engrs. CD 2/24, under LB.

▲† **P. Wks. Office,** First Naval Dist., 495 Summer St., Boston, Mass., cancelled bids to have been opened May 18, fleet berthing facilities, NOY 73788, Spec. 34829. NEWPORT, R. I. **$4,000,000.** CD 4/2.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 20 Maryland April 23 Pennsylvania
April 26 New Jersey

BIDS ASKED—BUILDINGS

▲ **Pa., Pittsburgh**—HOSPITAL, etc.—B.A. 5/18—Bd. Comrs., Allegheny Co. County Office, Pittsburgh, general hospital, greenhouse, nurses bldg., attendants bldg., stag residences, etc., Scott Twp. $17,757,432. CD 10/3/50.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Shelby-Coleridge Co.,** c/o A. N. Sirof, engr., 207 E. 37 St., New York 16, N. Y. Owner Builds. Approx. $11,000,000. 800 HOUSES and SHOPPING CENTER, 300-acre tract, Rte. 6, near Rte. 202 to be called "Gull Manor", CORTLANDT, N. Y. (Correction—engineer's address). CD 4/8, under CA.

▲ **Depot Constr. Corp.,** 119 W. 57 St., New York 19, N. Y. CA Approx. **$5,000,000.** 15 and 18 story APARTMENTS, Tudor City Pl. from 40 to 41 Sts., NEW YORK, N. Y. Two Tudor City Place Corp., c/o contractor. William I. Hohauser, 151 W. 51 St., New York 19, N. Y., archt. CD 4/2.

▲ **Uris Bros.,** 575 Madison Ave., New York 22, N. Y. Owner Builds. **$9,000,000.** 25 story OFFICE bldg., 300 Park Ave., between 49 and 50 Sts., NEW YORK, N. Y. Emery Roth & Sons, 575 Madison Ave., New York 22, N. Y. archts. CD 8/20/52.

▲ **Sutton Hill Homes,** c/o Oscar I. Silverstone, archt., 153 Pierrepont St., Brooklyn 2, N. Y. Owner Builds. **$4,500,000.** 300 HOUSES, tract in Haypath Rd., adjoining Bethpage State Park, PLAINVIEW, N. Y.

▲ **Roslyn Constr. Co.,** 3207 Brunswick Ave., Drexel Hill, Pa., Separate Contracts. $3,000,000. RESIDENTIAL DEVELOPMENT, Aston Manor, CHESTER, PA.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 20 West Virginia April 23 Kentucky
STREETS AND ROADS
April 23 Kentucky

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Southeastern Constr. Co.,** 301 W. 2 St., Charlotte, N. C. CA Est. **$3,250,000.** 14 story BANK and OFFICE, JACKSON, MISS. First National Bank, 329 E. Capitol St., Jackson, Miss. N. W. Overstreet & Assoc., 201 N. Lamar St., Jackson, Miss., and James Canizaro, Deposit Guaranty Bank Bldg., Jackson, Miss., archts. CD 1/13/53.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **O., Youngstown**—HOUSING—B.A. 5/10—Youngstown Metropolitan Housing Auth., 976 W. Federal St., 300-unit Kimmel Brook Homes. Proj. Ohio 2-3. $3,000,000. Plans deposit $100. CD 3/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **ILLINOIS**—State Div., Hys., Springfield, **J. C. O'Connor & Sons, Inc.,** 2140 Miner St., Fort Wayne 6, Ind., CA, **$1,037,823,** c. conc. base course 3.48 mi. and c. conc. base course wid'n. 13.68 mi. U. S. 51, Fayette Co.;

Regenhardt Constr. Co. & R. W. Wood, P.O. Box 440, Cape Girardeau, Mo., CA, **$850,048,** c. conc. 3.18 mi., c. conc. base course 3.88 mi. U. S. 51 and 0.52 mi. c. conc. Ill. 13, Jackson Co.;

S. J. Groves & Sons Co., 1104 W. Reynolds St., Springfield, Ill., CA, **$2,879,178,** c. conc. 11.35 mi. F.A. 163, Pope and Saline Counties;

O'Connor Constr. Co., 320 Reisch Bldg., Springfield, Ill., CA, **$881,301,** c. conc. 6.88 mi. U. S. 66, Sangamon and Montgomery Counties. Bids Mar. 23, awarded Apr. 5. Grand total $5,648,350. CD 3/29, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 22 Missouri April 23 Kansas
STREETS AND ROADS
April 21, 23 Kansas April 22 Missouri
April 23 Minnesota, North Dakota

BIDS ASKED—BUILDINGS

▲ **Tex., Houston**—BANK, OFFICE, GARAGE—B.A. 4/27—Second National Bank of Houston, 800 Main St., 24 story bsmnt. steel, granite on brick back-up exterior walls, bank and office, $4,500,000; parking garage, $500,000. Extended date. Kenneth Franzheim, 2402 Crawford St., archt. H. E. Bovay, Jr., M. Esperson Bldg., and Reg. F. Taylor, Bankers Mortgage Bldg., and Ward Butterwick, 2303 LaBranch St., engrs. CD 3/22.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Everett Schneider Co.,** 10406 Manchester Rd., Kirkwood 22, Mo. Owner Builds. **$3,000,000.** RESIDENCES, streets, walks, drives, etc., in Bennett Hill subdivision on 75 acre tract on north side of Manchester Rd. at Kirkwood-Glendale line in Warson Woods area, KIRKWOOD (ST. LOUIS 22 P.O.), MO.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 22 Washington
STREETS AND ROADS
April 28, 29 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **A. Teichert & Son, Inc. & M. J. Bevanda,** Box 397, Baldwin Park, Calif., CA, **$3,087,946,** West Embankment outlet works and relocation of Lincoln Ave., El Monte, Los Angeles Co., CIVENG-04-353-54-29, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 25. CD 3/30, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Kitchell-Phillips Constr. Co., Inc. & Utah Constr. Co.,** 1706 W. Buchanan St., Phoenix, Ariz., CA, **$2,727,160,** 71,000 sq. ft. TEST FACILITY BLDG., adjacent to Sky Harbor Airport, PHOENIX, ARIZ. Airesearch Mfg. Co., Division of Garrett Corp., 9851 Sepulveda Blvd., Los Angeles, Calif. Bids Feb. 26. CD 3/3, under LB.

▲ **Rothschild, Raffin & Weirick,** 274 Brannan St., San Francisco, Calif., LB, **$3,764,000.** HILLSDALE SCHOOL, SAN MATEO, CALIF. Bd. Trustees San Mateo Union High School Dist., 650 N. Delaware St., San Mateo, Calif. Bids Mar. 31. CD 2/26.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Poole Constr. Co. Ltd.,** 2402 2 A St. S.E., Calgary, Alta., LB, **$2,937,000,** est. $2,800,000. Col. Belcher HOSPITAL addns., alterations, CALGARY, ALTA. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Mar. 10. CD 1/26.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Grove, Shepherd, Wilson & Kruge,** 247 Park Ave., New York, N. Y., CA **$4,096,083,** est. $4,473,426, eight 3 story, 37x220 ft. rein.-con. airmen's dormitories, three 1 story 112x141 ft. rein.-con. mess and admin. bldgs., Ladd Air Force Base, ENG-95-107-54-77, ALASKA. U. S. Eng., 4735 Marginal Way, Seattle 4, Wash. Bids Mar. 24. CD 3/31, under LB.

(Proposal Advertisements see pp. 99 to 103)

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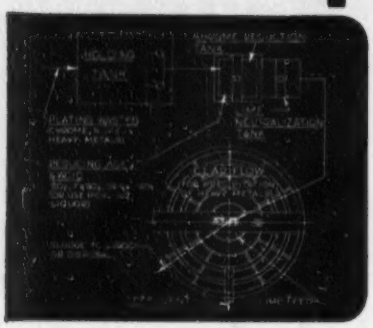

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UNIT PRICES

Concrete bid takes overpass contract in Florida

With the two lowest bids for the $1,904,000 Myrtle Avenue Overpass superstructure only 0.1% or $1,860 apart, Wainer Construction Company, Valdosta, Georgia, underbid the second low bidder by $69,784 on one Class A concrete item. This amount more than covered the spread between the high and low bids.

The State Road Department of Florida awarded this section of the Jacksonville Expressway System. Sam P. Turnbull is the state highway engineer in charge.

This overpass will be 1,431 ft long including seven 50-ft rolled beam spans: one 70-ft plate girder span; four 81.25-ft plate girder spans; one 158.5-ft continuous girder span; one 141.58-ft continuous girder span; and one 385.5-ft, 3-truss tied arch span.

Work on the project started Feb. 10, 1954; completion date is Jan. 31, 1956. Minimum prevailing wages in Jacksonville are: skilled labor $1.00 per hour, semi-skilled $0.75, common, $0.75. The contractor furnishes all materials. Job is at the railhead with rail, highway and water transportation available.

Bidders include:

1C	Wainer Const. Co., Valdosta, Ga.	$1,904,167
2	Industrial Const. Co., Jacksonville, Fla.	1,906,027
4	The Geo. D. Auchter Co., Jacksonville, Fla.	1,948,516

Bids: 12-22-53 Item	Unit	Quantity	Unit Prices 1C	2
Conc, cl A, bridge deck	cy	3,101	$67.50	$90.00
Conc, cl A, approach slabs	cy	143	39.00	25.00
Reinf stl, bridge deck	lb	529,170	0.12	0.13
Reinf stl, approach slabs	lb	14,360	0.115	0.10
Conc handrail	lf	2,095	7.00	12.00
Str carbon stl, girder & beam spans	lb	3,084,775	0.224	0.211
Str carbon stl, truss span	lb	2,658,600	0.249	0.24
Str silicon stl, in trusses	lb	660,000	0.291	0.289
Misc iron & steel	lb	75,730	0.56	0.35
Steel handrail	lf	780	15.25	15.00
Roadway lighting	ls	1	15,000	14,700

California sewer bids attract lively competition

Seven of 14 contractors bid under the engineer's estimate on a $270,462 sanitary sewer system for Palmdale, California, to be built for the County of Los Angeles. The low bid is 11% below the engineer's estimate and 5% under the second low bid. William J. Fox is county engineer.

N. J. Vusich, the successful contractor, underbid the second low bidder on all diameters of single strength vitrified clay pipe. He was lower by 26% on 12", 12% on 10", 5% on 8", and 8% on 6"; the dollar difference was $15,560.

The project includes 10.37 miles of main line sewer plus house laterals of

27,810 ft. Depth of the main line sewer varies from eight to twelve feet. Since Palmdale is subject to frequent Mojave Desert sand storms, the contractor could have considerable trouble in making his cement mortar pipe joints.

The contractor provides all materials. Work was scheduled to start March 29 and be completed by September 25. Prevailing wage rates are: skilled labor $2.57 per hour, semi-skilled $2.38, common $1.94. A railroad is at the construction site; rail and highway transportation are available to the project.

Bidders include:

1C N. J. Vusich, Los Angeles 62, Calif. $270,462
2 M. Miller Co., Los Angeles 61, Calif. 283,463
14 A. R. Milosevich & Son, Arcadia, Calif. 363,114
EE William J. Fox, County Engr., Los Angeles .. 304,900

Bids: 2-19-54 Item	Unit	Quantity	Unit Prices 1C	2
12" SSVCP enc. in 36" steel pipe, main sew	lf	120	$40.00	$35.00
12" ESVCP, main sew	lf	490	4.00	5.20
12" SSVCP, main sew	lf	300	3.50	4.70
10" ESVCP, main sew	lf	1,370	3.80	4.20
10" SSVCP, main sew	lf	9,040	3.25	3.70
8" ESVCP, main sew	lf	3,500	3.35	3.20
8" SSVCP, main sew	lf	39,930	2.75	2.90
6" ESVCP, house lat sew	lf	2,100	2.80	2.60
6" SSVCP, house lat sew	lf	25,710	2.40	2.60
Brick sew structures	ea	190	200.00	190.00
Trap manholes	ea	2	300.00	300.00
Install trap casting in exist trap manholes	ea	1	350.00	100.00

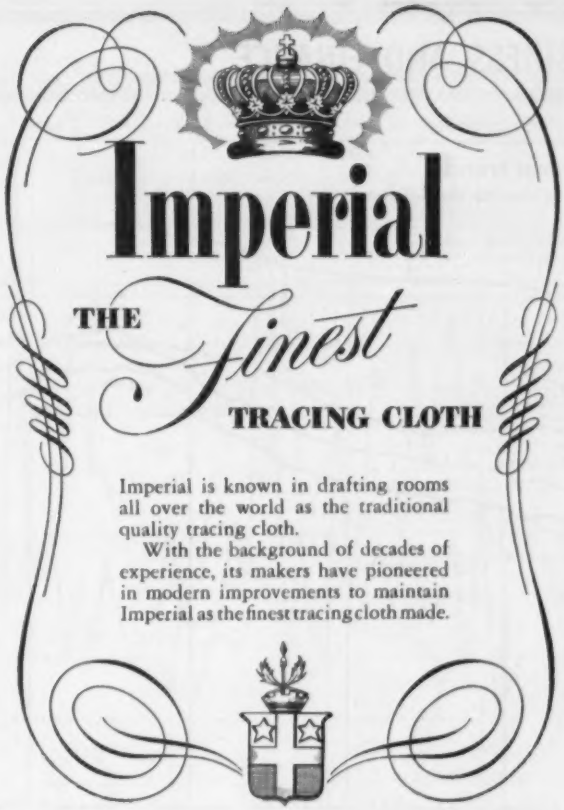
Kansas fishing dam bid 26% under estimate

For a $55,921 dam contract awarded by the Kansas Forestry, Fish & Game Commission, Train Construction Co., Lindsborg, Kans., was low bidder, 26% below the engineer's estimate and 2% below the second of 10 bidders. Wilson & Co., Salina, Kans., are the consulting engineers.

This dam will create the 46-acre McPherson County State Lake for public fishing. It is to be 800 feet long, 40 feet high, with concrete drop inlet spillway. Work on the project started April 1, will be completed August 1, 1954. Prevailing wage rates are: skilled $2.25 per hour, semi-skilled $1.75, common labor $1.25. The contractor furnishes all materials. The job is eight miles from the railhead at Canton; it can be reached by highway. Bidders include:

1C Train Const. Co., Lindsborg, Kansas $55,921
2 Heide & Christolear, Smith Center, Kansas ... 57,311
10 E. H. Holtzen, Enid, Oklahoma 84,786
EE Wilson & Co., 223 N. Santa Fe St., Salina, Kansas 75,230

Bids: 2-26-54 Item	Unit	Quantity	Unit Prices 1C	2
Clear lake & dam sites	ls	1	$2,300	$1,250
Earth exc	cy	131,000	0.18	0.19
Overhaul	stay	15,000	0.015	0.02
Conc spillway & outlet	ls	1	16,879	17,900
Rock riprap	sy	4,600	1.87	1.75
Fence	rod	540	4.47	5.85
Fence gates	lf	48	3.50	4.00
Creek crossing fence	rod	20	4.47	10.00
Stock guard	ls	1	1,123	1,100
Fire guard	rod	540	1.00	0.50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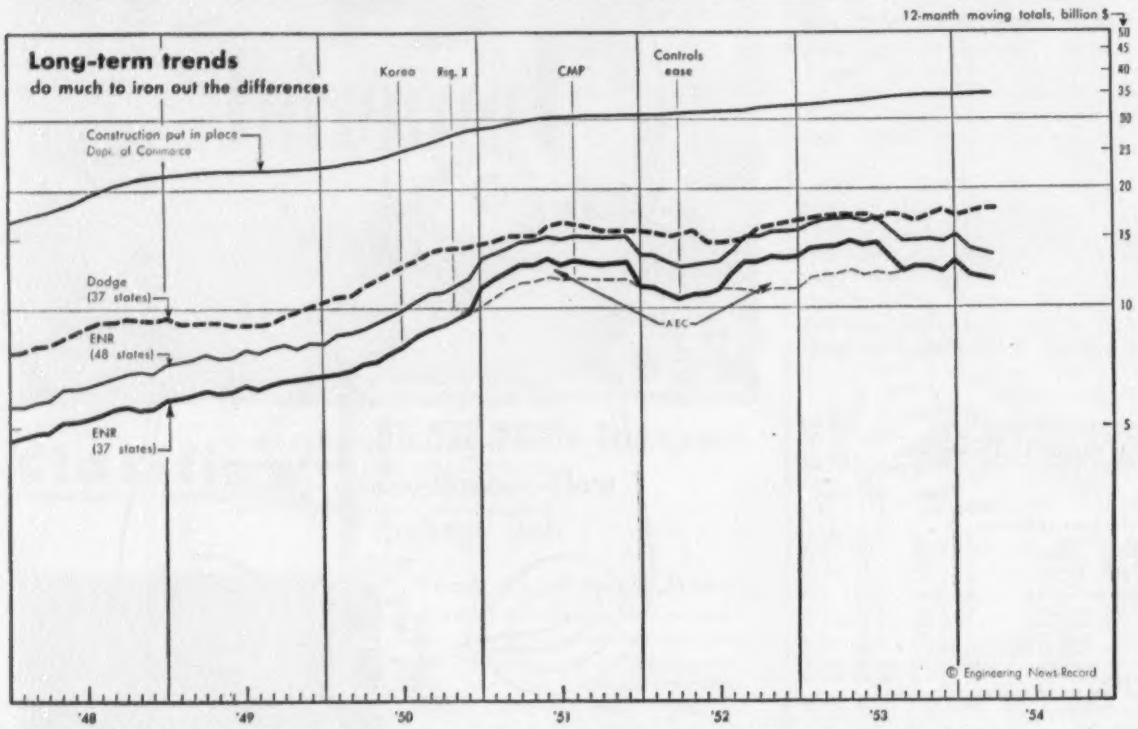


ENR STATISTICS MEASURE contracts when awarded, Dodge measures work starting. Department of Commerce estimates value of construction put in place. Here the three series are shown as 12-month moving totals.

Why ENR and Dodge disagree this year

The difference between these two measures of volume is mainly in the fact that ENR series reports work earlier

For the first quarter of this year, ENR's statistical series on contract awards is off 34% from last year, while the construction volume series reported by F. W. Dodge Corp., is 13% above the same 1953 period. This wide divergence has confused many who measure the business outlook by these two earliest indicators of construction activity.

However, the disparity between the ENR and Dodge series should not be confusing. It is quite usual for the ENR and Dodge series to move in opposite directions over short periods of time, even though in January and February they were unusually far out of phase.

The reason is simple: The ENR and Dodge series are based on different systems of reporting. Not only do they differ in geographical coverage, but they differ in depth of coverage on size of projects included.

Most important, they differ in timing. ENR's figures measure contracts awarded and start of buying for projects. The Dodge series measures new work starting.

Over the long term, when one allows for their differences, the two series agree closely (see chart above).

• **Depth of coverage**—ENR reports contract awards for all 48 states. Dodge covers 37 states, does not report for the 11 western states. ENR screens commercial, public building, and mass housing contracts by applying a $300,000 minimum. It reports industrial building contracts of $82,000 and up, waterways and waterworks projects starting at $34,000, and other public works from $60,000 up.

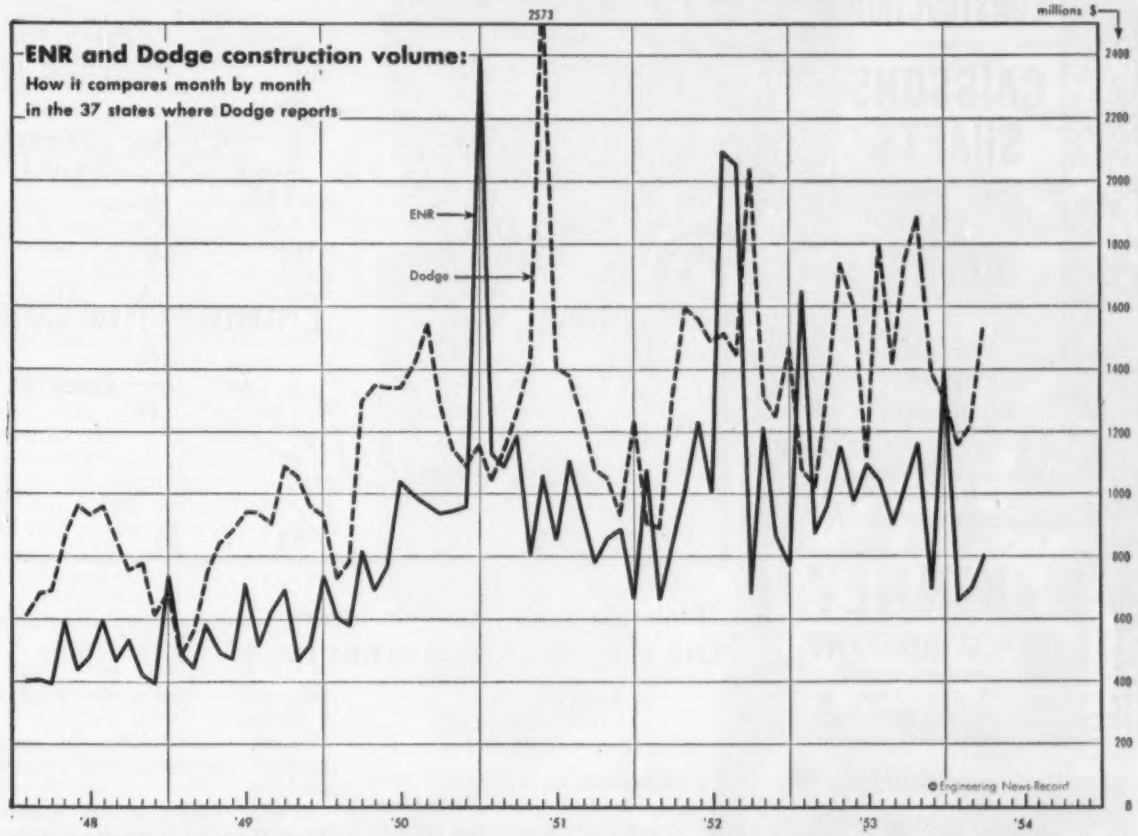
Dodge, on the other hand, reports projects as small as $10,000. The major effect this has on the ENR and Dodge figures: Dodge includes more housing activity.

• **Timing**—The big difference, however, lies in the fact that ENR reports the total value of contracts when they are awarded. The whole project goes into the figures in one lump. Dodge reports dollar volume as work is started. Thus its projects go into its figures piecemeal, as sections of the job are started or as subcontractors move onto the site.

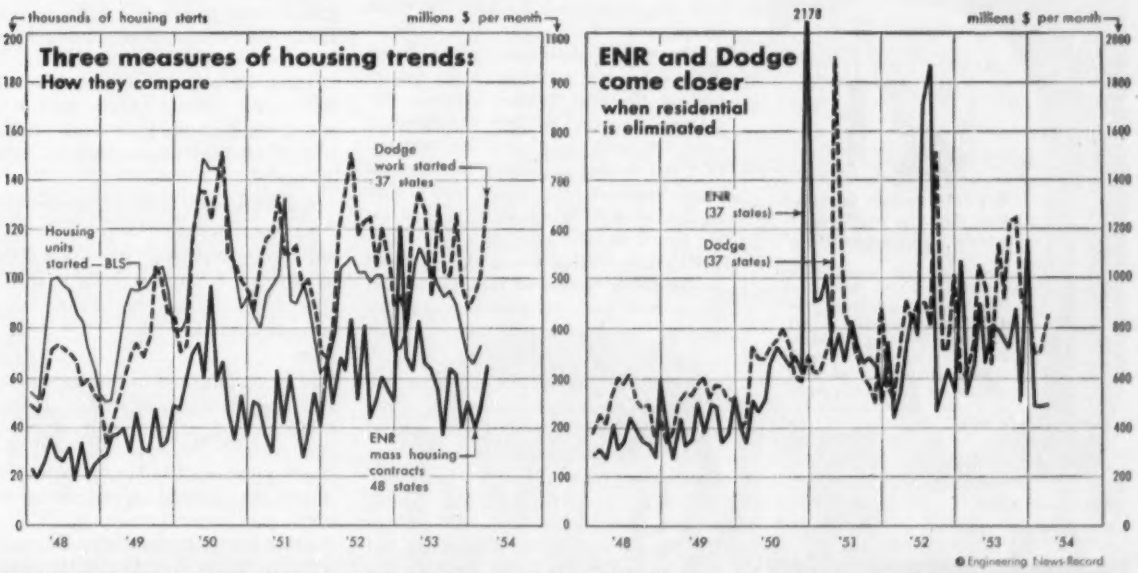
These differences result in higher peaks and lower valleys in the ENR series, while the Dodge series is less volatile. They also result in both earlier peaks and earlier valleys in the ENR curve (see top chart, at right). The ENR series can begin a new dip while the Dodge series, which spreads large projects over a period of months, is completing the previous rise. Similarly, the ENR series may take off on a new up movement while the Dodge series is still going down.

• **No correlation**—That's why there is no consistent relationship between ENR and Dodge over the short term. Suppose we eliminate from the ENR monthly totals the 11 western states for which Dodge does not report, thus putting the two series on the same

(*Continued on page 94*)



ENR CONTRACT AWARDS MOVE up and down several months earlier than the construction volume series reported by Dodge, this chart compares both on the same geographical basis. It shows how the huge volume of AEC awards in July-August of 1952 affected them. Dodge series did not show much of this until 1953.



HOME BUILDING IS MEASURED DIFFERENTLY by ENR and Dodge. But ENR series reports residential contracts sooner, often giving earlier warning of declines in the housing starts reported monthly by Bureau of Labor Statistics (left-hand chart). Dropping out residential work brings the two series closer together.

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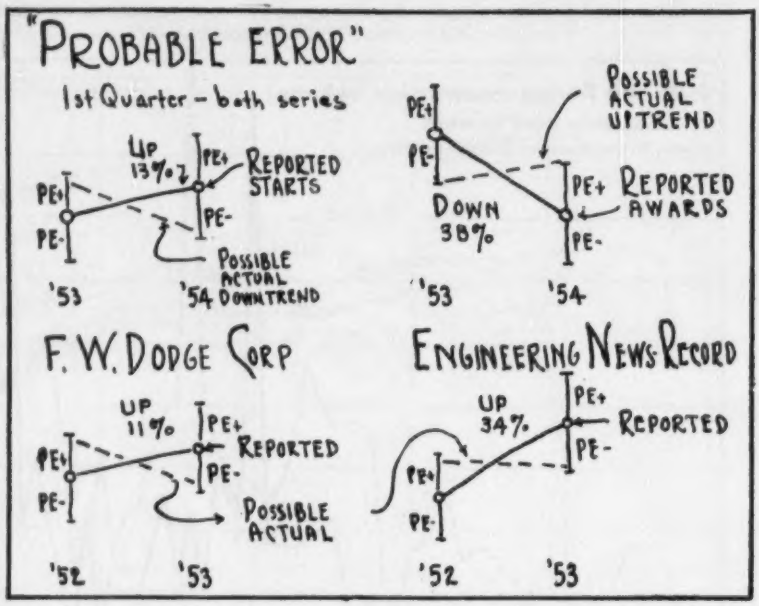

"Probable error" analysis favors ENR measure of construction trends

George H. Petit
Trend Analysis
West Hartford, Conn.

Confusion over the +13%, and −38% divergence between Dodge and Engineering News-Record (in measuring construction activity in 37 states for the first quarter of this year compared with last year) illustrates the folly of drawing conclusions as to long-term trends based on short-term comparisons.

All evidence indicates that the strong uptrend for new construction has topped out for the time being. The very discrepancy between the two big statistical series very well could affirm the existence of a vast turning movement to somewhat lower volume levels. When such a turn is close at hand it would be natural for the figures to be at odds with each other. ENR's data, leading that of Dodge, would be the first to break away from the parallel trends both have maintained so perfectly through the boom. The moving totals should give the final answer by the end of the year.

Another possible answer lies in the theory of the mathematical "probable error."

In field reporting of such magnitude neither Dodge nor ENR can possibly report all projects, nor can they always report the exact value of each project. Such variations can differ from territory to territory and from one month in a particular year to the corresponding month of the year before.

Thus, where a small 13% increase over two similar periods a year apart is reported, the probable error could well turn a small reported advance into an actual decline.

But when an equally competent gathering source reports a more recent and a much larger percentage figure as a decline of 38%, it is far less probable that an error could convert this decline into a percentage advance.

geographical basis. Last year, the two 37-state figures moved in the same direction for eight months out of twelve. That was an unusually close correlation, for in 1952 the two totals moved up or down together in only six out of twelve months. In each of the three years 1949, 1950, and 1951 they moved up or down together less than half the time.

While ENR contracts report new trends ahead of the Dodge series, the lead time varies according to the size and type of work, as well as by such other factors as materials deliveries, and weather, which seriously affect starting dates. This variation in lead time makes correlation even more difficult.

Over longer periods, the differences between ENR and Dodge are pretty well ironed out (chart, page 92). Also, the ENR lead is more apparent. To eliminate sharp ups and downs, both

curves are plotted as 12-month moving totals. Also, the effect of Atomic Energy Commission contracts is segregated in the ENR curve. Segregated AEC figures are not available for the Dodge series.

Another reason why the ENR and Dodge series have been moving in different directions in recent months lies in the different way they report residential building. If residential building is taken out of both series, and the result compared for the 37 states, both curves have been moving fairly closely together (see lower right-hand chart, page 93).

The fact that ENR reports for 48 states and Dodge for 37 has little effect in getting the two series out of phase. For instance, in 1953 total contracts reported by ENR in 48 states were down 5% from 1952. (This is on the basis of average weeks, since 1953 had an extra week.) If you apply the same process to ENR contract awards in 37 states, the trend was exactly the same—down 5%.

• **AEC contracts**—This 5% decline for 1953 compared with a 4% rise in Dodge volume. The reason for this difference was the $2.3-billion-plus AEC contracts reported by ENR in 1952. These projects shoved the ENR curve up sharply in 1952. Dodge, on the other hand, reported these contracts as work got started, so that a large part of the $2.3 billion went into Dodge figures for 1953.

If we exclude housing from the totals, the difference is even more striking. In 1953, the ENR non-housing total for 37 states was down 30% from 1952, due to the AEC contracts let in the earlier year. The Dodge total, by contrast, was 4% higher.

It is interesting to note that last year ENR mass housing contracts forecast the drop in housing starts later reported by the Bureau of Labor Statistics (lower left-hand chart, page 93). ENR awards trended downward sharply in the first eight months, signalling that starts would also drop. Dodge reports on work started showed a series of sharp ups and downs through most of the year.

Success of turnpike issue is good omen for builders

As expected, investors snapped up the Pennsylvania Turnpike Commission's $233-million offering of revenue bonds. The issue was sold last week to finance the 110-mi Northeast Extension and half the cost of the Delaware River crossing to connect with the

(Continued on page 96)

Model HIP-600 150 hp Cummins Diesel, equipped with Twin Disc Model CF Torque Converter — installed by Watson & Meehan (Cummins dealer, San Francisco).

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Must Have Material, Lines, Racks and Cubicle Experience.

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New Jersey Turnpike. The bonds were soon selling in the open market above the offering price.

The issue was sold at an interest cost to the borrower of about 3.20%. Naturally, the success of this issue does not guarantee that other turnpike issues scheduled for this year can be sold this cheaply. The Pennsylvania Turnpike's record of earnings already has been tested by years of experience. Although for a time the latest issue will be secured only by the earnings of the turnpike sections it is financing, eventually it will be backed by earnings of the entire turnpike.

However, the temper of the market, as tested by this king-sized issue, indicates that future turnpike issues this year will get a good reception if the price is right. This week, a $27-million issue by the New Jersey Turnpike Commission was scheduled to reach Wall Street. This will finance the New Jersey Turnpike's share of the Delaware crossing. There will be other, bigger issues later on (ENR May 8, p. 129).

Court battle reveals profits of fast-growing Austin Co.

New testimony in a long legal battle between minority stockholders of Cleveland's Austin Co. and Austin's president, George A. Bryant, gives some idea of the fast growth in the construction company's profits. Bryant is battling for control of a 10% stock interest now held in trust for three daughters and a number of grandchildren of the late founder, Samuel Austin. (ENR Nov. 27, '52, p. 48).

Bryant got a setback last week when Common Pleas Judge William K. Thomas ruled that he should be removed as a member of the voting committee for the trust fund because his interests as president conflicted with those of the trust beneficiaries.

Court testimony revealed that when the stock was put in trust in 1939 with the Cleveland Trust Co. it was listed as having a value of $186,000. In the year 1951 alone, this 10% stock interest received $210,000 in dividends. In 1948, the trustees rejected an offer of more than $2 million for the stock.

MC&S wins proxy battle

MC&S, big construction firm, seems to be taking another step toward diversification. After a proxy battle, three Merritt-Chapman & Scott directors have been seated on the board of Marion Power Shovel; of Marion, Ohio.

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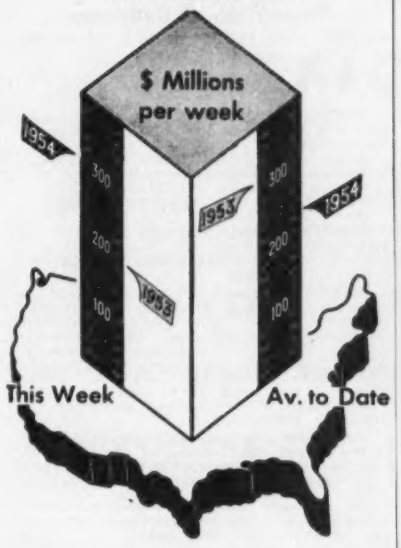
GETMAN BROTHERS Manufacturing Division, South Haven, Michigan

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	This Week	Cumulative 15 wks 1954	1953	% chge
Federal	$21.4	$269.1	$461.4	−42
State and municipal	92.8	1,235.5	1,334.9	−7
Total pub.	114.2	1,504.6	1,796.3	−16
Total priv.	192.4	1,912.3	2,784.4	−31
U. S. total	**$306.6**	**$3,416.9**	**$4,580.7**	**−25**

Contracts by type of work

Waterworks	$3.7	$56.1	$73.5	−24
Sewerage	7.4	94.8	101.2	−6
Bridges	5.2	119.3	171.7	−31
Highways	45.5	416.1	392.5	+6
Earthwork, waterways	4.7	77.9	108.2	−28
Buildings:				
Public, excl. hsg.	29.9	476.7	478.7	−0.4
Housg., pub.	4.5	53.7	217.8	−75
Housg., priv.	102.0	1,056.9	1,175.4	−10
Commercial	34.9	335.1	277.1	+21
Industrial	46.8	453.2	1,114.8	−59
Unclassified	22.0	277.1	469.8	−41
Total	**$306.6**	**$3,416.9**	**$4,580.7**	**−25**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)	Week of Apr. 8 1954	Cumulative 14 Wks 1954	% chge 1953-54
Corporate securities	$38.1	$796.0	−23
State and municipal:			
Excluding housing	95.9	1,036.1	5
Housing	9.8	42.6	−76
Federal loans	1.5	28.3	−34
Federal aid	...	...	...
Total non-federal	**$145.3**	**$1,903.0**	**−15**
Federal approps.:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	**$145.3**	**$1,903.0**	**−15**

ENR indexes		Base years = 100 1913	1926	1949
Constr. cost	Apr '54	615.36	295.80	129.00
	Mar '54	613.99	295.14	128.71
Bldg. cost	Apr '54	437.94	236.74	124.49
	Mar '54	437.17	236.32	124.27
Volume	Mar '54	426	173	123
	Feb '54	345	140	100

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OFFICIAL PROPOSALS

Bids: April 27, 1954

Demolition of Buildings

ROUTE S-28 (1927) ROUTE 18 (1953), SEC. 4-D
STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

Route S-28 (1927) Route 18 (1953), Section 4-D, from Albany Street to Commerce Square, Demolition of Buildings, City of New Brunswick, Middlesex County. Length 0.071 miles. The principal items of work are:

Estimated: 3,800 cu: yds. Borrow Excavation 25 Buildings to be demolished

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 27, 1954 at ten o'clock (10:00 A.M.-EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.-DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: April 30, 1954

Construction of Hangar

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
HANGAR NO. 11
CONTRACT NYA-363.002

Sealed proposals for the construction of Hangar No. 11 at New York International Airport, including paving and utilities therefor, will be received at the office of the Director of Aviation of The Port of New York Authority, Room 1539, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on the afternoon of Friday, April 30, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief, Aviation Planning Division of the Authority, Room 1572, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Chief, Aviation Planning Division, who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record 330 West 42nd Street New York 36, N. Y.

Bids: April 22, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Canal Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 22nd day of April 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No:	Name	Miles	Type	Deposit	Estimated Cost of Wor
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.						
Washington	FARC 54-9	Hudson Falls Village: Main Street, SH 9313 Hudson Falls Village: Boulevard & La Crosse Street, SH 1638 Proj. F-391(9), S-426(1), F-413(5)	1.42	Asp. Conc. Opt.	$4,000 Plans $10	$70,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Madison and Chenango	FARC 54-17	New Berlin–Leonardsville Pt. 1, SH 1731 New Berlin–Leonardsville Pt. 2, Leonardsville–Bridgewater Pt. 2, SH 1824 Proj. F-1049(3)	6.61	Asp. Conc. Opt.	$25,000 Plans $10	465,000
DISTRICT No. 4, E. G. H. Youngman, District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FAC 54-4	Rochester City: Inner Loop (Sta. 241+00 to Main Street West, Court Street Connection, Fitzhugh Street South to Sta. 241+00) Proj. U-231(4), U-1089(4)	0.53	Demolition and Misc. Work	$4,000 Plans $10	72,000
DISTRICT No. 5, C. R. Watts, District Engineer, 65 Court Street, Buffalo, N. Y.						
Erie	FARC 54-50	Southwestern Boulevard, SH 9269 Proj. F-1079(3)	6.30	Asp. Conc. Opt. = 6.25 Mi. Misc. Work = 0.05 Mi.	$45,000 Plans $15	830,000
Erie	FARC 54-56	Holland-Yorkshire Pt. 2, SH 9086 Proj. F-113(4)	3.73	Asp. Conc. Opt. = 3.72 Mi. Misc. Work = 0.01 Mi.	$16,000 Plans $10	284,000
Niagara	M 54-2	Barge Canal Bridge E-233 Main St.: Lockport	0.07	Repair & Resurface Bridge Floor	$5,900 Plans $10	105,680
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia	FARC 54-54	Nevis–Blue Store, SH 589 Proj. F-322(12)	2.59	Asp. Conc. Opt.	$9,400 Plans $10	187,000
Columbia	FARC 54-55	North Hillsdale–Austerlitz, SH 8234 Spencertown–Austerlitz, SH 5629 Proj. F-337(4)	3.39	Asp. Conc Opt	$10,000 Plans $10	182,000
Putnam	FARC 54-58	Fishkill–Peekskill Pt. 2, SH 5387 Peekskill–Fishkill Pt. 3, SH 5156 Proj. F-394(11)	4.28	Asp. Concrete Opt.	$19,000 Plans $10	344,000
Rockland	FASS 54-7	Access Road: Pearl River–Palisades Interstate Parkway Convent Road–Pearl River Proj. S-95(2)	1.54	Asp. Concrete Opt. Comp. I-Beam Br. 82'	$17,000 Plans $10	301,000
Rockland	PIP 54-1 RC 54-51	Palisades Interstate Parkway (Sect. 2) State Line–Orangeburg, SH 728	2.70	Grading & Structs. = 2.40 Mi. 8" Cem. Conc. Pavt. Var. Wide = 0.30 Mi. 5 Gr. Seps. Rigid Frames 46.9', 151.2', 136', 105' & 128' 1 Gr. Sep. R. C. Arches 109' 2 Brs. R. C. Closed Boxes 22.5' & 56'	$225,000 Plans $100	3,750,000
Ulster	FARC 54-57	Pine Bush–Ellenville Pt. 3, SH 8441 Project F-543(8)	5.72	Asp. Concrete Opt.	$21,000 Plans $10	386,000
DISTRICT No. 9, F. W. Donovan, District Engineer, 71 Frederick St., Binghamton, N. Y.						
Broome	FASH 54-7 FASH 54-8P FARC 54-52	Johnson City: Floral Avenue; Johnson City: Route 17 Conn. FASH 52-2; Riverside Drive, SH 444 Riverside Drive-Binghamton, SH 5377 Proj. U-1092(4)	(0.67) (Acc.) 1.14 (Hy.)	Asp. Conc. Type 2-A	$40,000 Plans $15	692,000
Otsego	FASSH 54-4	Roseboom–Jaresville Pt. 1 Proj. S-412(1)	8.04	Bit. Mac. Pen. Meth. 2 Brs. Comp. I-Beams 65' & 54'	$55,000 Plans $25	967,000
Otsego	FASSH 54-6	Kelsey Corners–Oaksville Proj. S-413(1)	6.64	Bit. Mac. Pen. Meth. I-Beam Br. 29'	$68,000 Plans $25	1,235,000
Otsego	FARC 54-59	Springfield–East Springfield, SH 8047 East Springfield–Cherry Valley, SH 934 Cherry Valley–Sharon Springs, Sharon Springs–Canajoharie, Pt. 1, SH 8064 Proj. F-FG 65(3)	(1.53) (Acc.) (7.19) (Hy.)	Asp. Conc. Opt. Hy. Sep. Comp. I-Beam 57.6' RR Sep. Weld. Plate Girder 155.1'	$200,000 Plans $50	3,604,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway, Babylon, L. I., New York						
Bronx	FAMDE 54-1	Major Deegan Expressway (Cont. No. 3) Proj. U-1062(11)	1.21	9" Cem. Conc. Pavt. 2 @ 32'—36' Wide = 0.67 Mi. Misc. Work = 0.54 Mi. Superstructure 2570' Conc. & Steel Viaduct	$249,000 Plans $50	4,527,000
Nassau	FARC 54-53	Jerusalem–Front Street Road, SH 437 Proj. S-429(1)	3.48	Asp. Conc. Opt. = 3.30 Mi. Misc. Work = 0.18 Mi.	$18,500 Plans $15	336,000
Nassau	FASS 54-6 SSP 54-1	Peninsula Boulevard Cont. 5 (So. St. Pkwy. Interch.) Southern State Parkway Proj. S-319(4)	1.51	Asp. Conc. Opt. = 0.43 Mi. 8" Col. Cem. Conc. Pavt. 2 @ 24' Var. Wide = 0.48 Mi. 8" Cem. Conc. Pavt. (Ramps) = 0.60 Mi. Alterations and Additions to Existing Hy. Sep. Struct.	$73,000 Plans $25	1,223,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: May 6, 1954

Construction of Highway Bridge

INVITATION TO TENDER

The City of Clinton Bridge Commission invites the proposals of prequalified bidders on a total of seven (7) contracts for the construction complete of a two-lane highway bridge and its approaches over the Mississippi River between the City of Clinton, Iowa and East Clinton, Illinois. The contracts are listed as follows:

No. 1 Earthwork
No. 2 Bridge Substructure
No. 3 Bridge Superstructure
No. 4 Approach Roadway Paving
No. 5 Administration Buildings and Toll Houses
No. 6 Electrical Wiring and Electrical Equipment
No. 7 Illinois Approach Overpasses

Complete sets of plans, specifications and contract documents for bidding purposes may be secured from Mr. Fred G. Hansen, Secretary, City of Clinton Bridge Commission, P. O. Box 70, Clinton, Iowa at the following prices:

Contract No. 1 $20.00 Contract No. 4 $20.00
Contract No. 2 $35.00 Contract No. 5 $20.00
Contract No. 3 $35.00 Contract No. 6 $20.00
Contract No. 7 $20.00

Plans and documents for all seven contracts may be secured at a price of $100.00.

No refunds will be made upon plans and documents returned.

Proposals shall be submitted in the double pocket envelope provided and on the forms provided in the "Contractor's Proposal" which is part of a bound book containing all of the contract documents and the specifications. Two copies of this book will be furnished to each potential bidder. Each proposal shall be accompanied by a copy of this Addendum No. 1 (and any further addenda which may be issued during the advertising period) bearing signature of acknowledgement and acceptance by the bidder.

Each proposal shall be accompanied by evidence of qualification of the bidder by either the Iowa Highway Commission or the Illinois Division of Highways, and shall also be accompanied by a certified check made payable to the order of the City of Clinton Bridge Commission in the amount listed below for each Contract on which a proposal is made:

Contract No. 1 $30,000
Contract No. 2 $130,000
Contract No. 3 $150,000
Contract No. 4 $15,000
Contract No. 5 $5,000
Contract No. 6 $2,000
Contract No. 7 $15,000

Proposals will be received by the City of Clinton Bridge Commission, P. O. Box 70, Clinton, Iowa until 2:00 p. m. Central Standard Time, May 6, 1954, at which time the bids will be publicly opened and read in the municipal courtroom at the County Court House, Clinton, Iowa.

The proposal provides for the return of certified checks of all bidders within ten days, except those of the lowest satisfactory bidder on each contract.

The City of Clinton Bridge Commission reserves the right to delay final acceptance of the lowest satisfactory bids for a period of sixty days, after the receiving date, final execution being subject to the successful sale of an issue of revenue bonds required for the completion of financing the project.

The City of Clinton Bridge Commission is a quasi-public agency created by Public Law No. 526 of the 78th Congress, as re-enacted by Public Law No. 357 o fthe 79th Congress and further extended by Public Law No. 220 of the 81st Congress.

The Commission is operating with the advice and financial aid of the:

Iowa Highway Commission
Illinois Division of Highways
U. S. Bureau of Public Roads

THE CITY OF CLINTON BRIDGE COMMISSION
Mark Morris, Chairman
Fred C. Hansen, Secretary

Bids: May 4, 1954

Construction of Water Testing Laboratory

KENSICO WATER TESTING LABORATORY CONTRACTS 394, 431 432 and 433

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on TUESDAY, MAY 4, 1954, for each of Contracts 394, 431, 432 and 433 for the constructing and equipping of the Kensico water testing laboratory, located in the Town of Mount Pleasant, Westchester county, New York, all as set forth in the specifications, as follows:

CONTRACT 394, for the construction of the Kensico water testing laboratory, furnishing and installing certain equipment and furniture and furnishing electricity for temporary light and power for the work of constructing and equipping the laboratory. The laboratory will be about 128 feet long and 34 feet wide, consisting of a two-story central portion about 65 feet long, with basement, attic and pitched roof, and of two one-story wings with flat roofs. It will have a structural steel frame, exterior walls of brick with granite trim and interior walls or partitions of brick or hollow tile. The roof of the central portion will consist of pre-cast, nailable, concrete slabs covered with slate roofing, and the roofs of the wings will consist of reinforced concrete slabs, cast in place, and covered with built-up roofing coated with slag or gravel.

CONTRACT 431, for furnishing, delivering, installing and testing plumbing, water supply system and appurtenant equipment and for performing appurtenant work. The plumbing will consist of water, air, vacuum and gas distribution piping, plumbing fixtures and complete drainage systems for sanitary, chemical and other wastes; the water supply system will consist of two deep well pumps, a pressure tank, air compressor and an underground water main, and the appurtenant equipment will include an instantaneous hot water heater, compressors and vacuum pumps with tanks.

CONTRACT 432, for furnishing, delivering, installing and testing heating, ventilating and steam generating equipment. The heating system will be a low pressure system with two oil-fired steam boilers; the ventilating equipment will include a fresh air ventilating unit and four exhaust fans, and the steam generating equipment will have a high pressure, oil-fired steam boiler.

CONTRACT 433, for furnishing, delivering, installing and testing electric systems and equipment. The work will comprise electric light, power, fire detection, alarm and signal systems in the laboratory, an underground electric feeder to the Lower effluent chamber, a power system in that chamber and a temporary electric system for transmitting electricity for temporary light and power for the work of constructing and equipping the laboratory.

Pamphlets containing information for bidders, forms of bid and contract, specifications, requirements as to surety, etc., of each contract, can be obtained in Room 1316 at the above address. Reproductions of the contract drawings for Contract 394 are bound in each pamphlet for this contract and blueprints of the contract drawings for Contracts 431, 432 or 433 will be supplied with each pamphlet for the respective contracts. A deposit of $5.00 in cash or its equivalent will be required for each pamphlet including drawings and application may be made in person or by mail. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet with drawings returned in acceptable condition. For further particulars apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: April 23, 1954

Contract No. 203 Grading, Drainage and Bridges

MAINE TURNPIKE AUTHORITY
MAINE TURNPIKE
Section 2—Portland to Augusta
AUGUSTA EXTENSION

Sealed Proposals will be received by the Maine Turnpike Authority for:

CONTRACT NO. 203
GRADING, DRAINAGE AND BRIDGES

at the offices of the Authority, 17 Bishop Street, Portland, Maine until 10:00 A. M., Eastern Standard Time on April 23, 1954, at which time and place the Proposals will be publicly opened and read.

The work under this Contract includes Grading and Drainage Construction from Spring Street in the Town of Scarboro near Mile 43 to north of High Street in the Town of Falmouth near Mile 51 including the South Portland Connection, Falmouth Spur and Route 100 Connection and the construction of 15 Bridges, exclusive of the fabrication and delivery F.O.B. cars at Portland, Maine of the steel superstructures therefor but including the erection thereof, along the route of the Turnpike from Mile 43 to Mile 51 and the Falmouth Spur, all in the Town of Scarboro, City of South Portland, City of Portland and Town of Falmouth.

The principal items of work will include:

GRADING AND DRAINAGE	
Clearing, Acres	155
Excavation—Earth, Cubic Yards	1,892,905
Excavation—Rock, Cubic Yards	243,925
Borrow, Cubic Yards	1,876,539
Pipe, Linear Feet	47,622
Inlets, Each	135
Concrete, Cubic Yards	1,168
BRIDGES	
Structural Excavation—Earth, Cubic Yards	12,042
Structural Excavation—Rock, Cubic Yards	1,196
Reinforcing Steel Bars, Pounds	1,665,738
Concrete in Piers & Abutments, Cubic Yards	8,575
Concrete in Superstructures, Cubic Yards	4,375
Driving Steel H-Piles, Linear Feet	32,071
Cast-in-Place Concrete Piles, Linear Feet	17,470
Erection of Steel Structures, Pounds	6,222,370
Metal Handrail on Concrete Parapets, Linear Feet	4,182

Plans and contract documents may be examined by prospective bidders during regular office hours at the offices of the Authority at the above address and at the offices of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y., and may be obtained from the Authority, 17 Bishop Street, Portland, Maine, upon payment of Fifty Dollars ($50.00) for each set. Bound sets of cross-sections will be furnished for an additional payment of One Hundred Dollars ($100.00) for each set.

The contract documents and sets of cross-sections need not be returned, and payments will not be refunded. Checks shall be made payable to Howard, Needles, Tammen & Bergendoff.

Proposals must be accompanied by a certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than five per cent (5%) of the total amount in the Proposal but not less than $500.00 nor more than $200,000.00.

Proposals must be made upon the Proposal Forms furnished separately by the Authority with the Contract Documents and must be enclosed in the sealed special addressed envelopes provided therefor bearing the name and address of the Bidder and the number of the Contract on the outside.

Before the award of the Contract, any Bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work within the time required and to the satisfaction of the Authority.

The Bidder, to whom a Contract is awarded, will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the Standard Contract Bond Form of the Authority, for a sum not less than the total amount of the Proposal.

The Authority reserves the unqualified right to reject all proposals or to accept that Proposal which in its sole judgment will under all circumstances serve its best interests. The Contract will be awarded or Proposals rejected within thirty days after the date of opening Proposals, except that in the event of default by a successful bidder the Authority reserves the right to accept the Proposal of any other bidder within twenty days after such default.

MAINE TURNPIKE AUTHORITY
Paul C. Thurston, Chairman
Portland, Maine
April 6, 1954

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

OFFICIAL PROPOSALS

Bids May 4, 1954

Contract EXD-130.009

THE PORT OF NEW YORK AUTHORITY
PORT AUTHORITY BUILDING
TWELFTH FLOOR ALTERATIONS

Sealed proposals for performing alterations on the twelfth floor of the Port Authority Building, 111 Eighth Avenue, New York 11, New York, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, May 4, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Contract Engineer of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Contract Engineer, who will furnish the documents.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, April 15, 1954

Bids: July 12, 1954

Construction of Road Bridge

GOVERNMENT OF IRAQ
DEVELOPMENT BOARD
MINISTRY OF DEVELOPMENT
LESSER ZAB ROAD BRIDGE NEAR
TAQ-TAQ

1. Tenders are invited by the Development Board of the Government of Iraq for the construction of a road bridge over the Lesser Zab River near Taq-Taq (65 Km. NNE of Kirkuk) with all piers and abutments.
2. The Contract Documents and Instructions as to tendering may be inspected on and after the 12th day of April 1954 at any of the following places, namely:—
   (a) the offices of the Directorate General of Contracts, Ministry of Development, Baghdad, Iraq.
   (b) The Embassies and Legations of Iraq or of countries representing Iraqi interest in U.S.A., Paris, Rome, Brussels and Bonn.
   (c) the offices of Messers. Coode & Partners, 9, Victoria Street, London, S.W.1.
3. Firms desiring to tender may obtain copies of the Contract Documents between the 12 day of April 1954 and the 12th day of June 1954 (both days inclusive) from either the Directorate General of Contracts, Ministry of Development in Baghdad, or Messrs. Coode & Partners in London upon payment of Twenty-five Iraqui Dinars. One Iraqui Dinar is equivalent to one pound Sterling.
4. Tenders must be accompanied by a deposit of I.D. 10,000 (Ten thousand Iraqi Dinars) to be made at an approved Bank established in Iraq or at a London Bank which is the recognised agent of such bank. Full detailed conditions as to this deposit may be ascertained from the "Instructions to Persons Tendering" attached to the Contract Documents.
5. Tenders must be submitted to the Secretary, the Development Board, (Directorate General of Contracts), Baghdad, Iraq, in sealed envelopes endorsed clearly on the outside with the words "Tender for Lesser Zab Road Bridge near Taq-Taq, Contract No. B/5/1954", and will be received up to noon on the 12th day of July 1954.
6. Particular attention is drawn to Article 22 of the Instructions to Persons Tendering, namely, that tenders will only be accepted from firms of Contractors who have previously executed works of a similar nature and magnitude.
7. The Board does not bind itself to accept the lowest or any tender.

Minister of Development.
Baghdad.

OFFICIAL PROPOSALS

Bids: April 22, 1954

Soil Explorations and Foundation Investigation

NOTICE TO CONTRACTORS
STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Standard Time, on April 22, 1954 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE LAKE ONONDAGA WEST SHORE DEVELOPMENT AND STATE FAIR BLVD. LIBERTY ST. TO ROUTE 48, CITY OF SYRACUSE AND TOWNSHIP OF GEDDES, ONONDAGA COUNTY WHICH CONSTITUTES CONTRACT NO. SPEC. SM-65

Maps, plans and specifications may be examined and obtained at the following offices:
(a) Bureau of Contracts and Accounts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany 1, New York
(b) Mr. William Robinson, District Engineer, 301 East Water Street, Syracuse, New York
(c) Mr. Charles Schaefer, Department of Public Works, 270 Broadway, New York City, New York.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $18,300.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $915.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. Tallamy
SUPERINTENDENT OF
PUBLIC WORKS

Bids: May 11, 1954

Construction of Building

THE PORT OF NEW YORK AUTHORITY
PORT NEWARK
SERVICE BUILDING
CONTRACT PN-260.001

Sealed proposals for the construction of a building at Port Newark, New Jersey, containing a garage, automotive and repair shops and incidental facilities, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday May 11, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Contract Engineer of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Contract Engineer, who will furnish the documents.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, April 15, 1954

OFFICIAL PROPOSALS

Bids: April 22, 1954

Contract No. 219 Androscoggin River Bridge

MAINE TURNPIKE AUTHORITY
MAINE TURNPIKE

Sealed Proposals will be received by the Maine Turnpike Authority for:
Section 2—Portland to Augusta
AUGUSTA EXTENSION
at the offices of the Authority, 17 Bishop Street, Portland, Maine until 10:00 A. M., Eastern Standard Time, on April 22, 1954, at which time and place the Proposals will be publicly opened and read.

The work included under this contract consists of the construction of the Androscoggin River Bridge, exclusive of fabrication and delivery F.O.B. cars at Lewiston, Maine, of the steel superstructure therefor but including the erection thereof. The structure is located in the Cities of Auburn and Lewiston near Mile 76 of the Turnpike Extension.

The principal items of work will include:

Structural Excavation, Cubic Yards	7,735
Reinforcing Steel Bars, Pounds	648,790
Concrete in Seals, Cubic Yards	3,052
Concrete in Piers and Abutments, Cubic Yards	6,451
Concrete in Superstructures, Cubic Yards	1,112
Erection of Steel Structures, Pounds	3,483,325

Plans and Contract Documents may be examined by prospective bidders during regular office hours at the offices of the Authority at the above address and at the offices of the Consulting Engineers, Howard, Needles, Tammen and Bergendoff, 55 Liberty Street, New York 5, N. Y., and may be obtained from the Authority, 17 Bishop Street, Portland, Maine upon payment of Twenty-Five Dollars ($25.00) for each set which will not be refunded. Checks shall be made payable to Howard, Needles, Tammen & Bergendoff.

Proposals must be accompanied by a certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than five per cent (5%) of the Total Amount in the Proposal but not less than $500.00 nor more than $200,000.00.

Proposals must be made upon the Proposal forms furnished separately by the Authority with the contract documents and must be enclosed in the sealed special addressed envelopes provided therefor bearing the name and address of the bidder and the number of the Contract on the outside.

Before the award of the Contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work within the time required and to the satisfaction of the Authority.

The Bidder, to whom a Contract is awarded, will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

The Authority reserves the unqualified right to reject all Proposals or to accept that Proposal which in its sole judgment will under all circumstances serve its best interests. The Contract will be awarded or Proposals rejected within thirty days after the date of opening Proposals, except that in the event of default by a successful bidder the Authority reserves the right to accept the Proposal of any other bidder within twenty days after such default.

MAINE TURNPIKE AUTHORITY
Paul C. Thurston, Chairman

Portland, Maine
April 5, 1954

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4151) will be received at Ephrata, Washington, until May 20, 1954, for furnishing labor and materials for earthwork, pipe lines, and structures, Area E-6 (Block 45) Lateral, Sublaterals, Wasteways, and Drains, East Low Canal Laterals, Columbia Basin Project, Washington. Location near Othello, Washington. Principal items are: 1,730,000 cu. yds. excavation; 216,000 cu. yds. earth lining; 5,160 cu. yds. concrete in structures; 27,360 lin. ft. concrete pipe lines; 13 outdoor pumping plants; and other work. Completion time 470 days. For particulars, address Bureau of Reclamation, Ephrata, Washington; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 10, 1954

Construction of Pumping Station

NOTICE TO CONTRACTORS
GREENWOOD LAKE VILLAGE, ORANGE COUNTY, NEW YORK PUMPING STATION AND WATER MAINS

Sealed bids will be received by the Board of Trustees of the Village of Greenwood Lake, New York on the 10th day of May, 1954 until 7:30 P.M., E.D.S.T. at the Village Office in the Fire Department Building for furnishing labor, materials and equipment and constructing a pumping station, water mains, together with furnishing miscellaneous material and equipment for wider distribution of water supply from the Greenwood Lake System.

The work has been divided into the following sections, and Contractor may bid on any or all sections. Bids will also be received from manufacturers for pipe, specials, valves and hydrants.

Section I shall consist of the Pumping Station with water mains and accessories on Pine Hill Drive, Maple Avenue, Hillcrest Avenue, Cedar Avenue, Glendale Road, Oakwood Avenue, Hillside Avenue, Mountain View Avenue and other streets and properties in the area as shown on the plans.

Section II shall consist of water mains and accessories in Lakelands Avenue as shown on plans.

Section III shall consist of Lake Drive and private road from Birch Drive to Tuxedo Road as shown on the plan.

Section IV shall consist of extending the water mains with accessories to and in Cascade Trail.

Section V shall consist of furnishing and installing 100,000 gallon steel storage tank on foundations furnished by others, per plans and specifications.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications and Performance Bond may be examined at the office of the Village Clerk, Mr. W. B. Phillips, Village of Greenwood Lake, New York. Copies thereof may be obtained at the office of Keis & Holroyd or from the Village Clerk upon payment of $25.00 for each set. Any bidder upon returning such set at the time of bidding and in good condition, will be refunded his payment and any non-bidder upon so returning such set within 30 days of the date for receiving bids, will be refunded $20.00.

The Board of Trustees of the Village of Greenwood Lake, New York reserves the right to waive any informalities in or to reject any or all bids. Award of contract or contracts is dependent upon the result of the permissive referendum required by law.

A certified check made payable to the order of the Village of Greenwood Lake, in the amount of Five Per Centum (5%) of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within five (5) days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so, he shall forfeit the deposit as liquidated damages and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Village of Greenwood Lake, New York, in the amount of the contract and having as surety thereon such surety company or companies as are acceptable to the Village of Greenwood Lake, New York.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

JNO. G. SCHLEICH, Mayor
KEIS & HOLROYD
Consulting Engineers
Troy, New York
Dated: April 10, 1954.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4143) will be received at Phoenix, Arizona, until May 20, 1954, for furnishing labor and materials for Oracle Substation and alterations to ED-5 Substation, Davis Dam Project, Arizona-Nevada. Locations: Oracle Substation, 4 miles north of Oracle Junction, Arizona; ED-5 Substation, 10 miles south of Eloy, Arizona. Principal items are: 3,280 cu. yds excavations; 146 cu. yds. concrete; 60,000 pounds, erecting structural steel; lump sum, furnishing and erecting prefabricated structural steel; 390 lin. ft., furnishing and installing conduit; and other work. Completion time 225 days. For particulars, address Bureau of Reclamation, Phoenix, Arizona; or Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 11, 1954

Construction of Interceptor Tunnel Sewer and Connecting Lines and Structures

OFFICE OF PURCHASING AGENT
CITY OF NASHVILLE, TENNESSEE
NOTICE TO CONTRACTORS
BIDS FOR PROJECT NO. 54-SD-1
NASHVILLE, TENNESSEE

Sealed proposals or bids will be received by the City Purchasing Agent of the City of Nashville, Tennessee, at Room 209 Courthouse—City Hall Building, until ten (10) o'clock A. M., on the 11th day of May, 1954, for furnishing of all materials, labor, tools, and appliances necessary for construction of:

INTERCEPTOR TUNNEL SEWER AND CONNECTING LINES AND STRUCTURES

Copies of the proposal, contract, documents, plans and specifications, may be obtained from the office of Rice, Harwood and Clark, Architect-Engineers, 905 American Trust Building, Nashville, Tennessee.

A charge of TWENTY-FIVE ($25.00) DOLLARS will be made for each set of contract documents, proposal, plans and specifications. Deposit will be refunded in full amount applicable to the first set obtained and returned by contractors submitting a bona fide bid. Deposit, less one-half principal sum thereof retained to cover cost of production and handling, will be refunded on all other sets returned within ten (10) days after opening of bids.

Each proposal or bid must be accompanied by a cashier's or certified check on a State or National Bank made payable to the City of Nashville, Tennessee, or a bidding bond executed by the bidder and a surety company authorized to transact business in the State of Tennessee, in the sum of not less than five (5%) per cent of the total amount of the bid. Said check or bond will be returned to the unsuccessful bidders as soon as contract has been awarded and to the successful bidder as soon as he has executed the contract and furnished the necessary bonds, and the same have been approved by the City Attorney and the contract has been executed by the City.

All bidders must be licensed contractors as required by Chapter 135 of the Public Acts of 1945 of the General Assembly of the State of Tennessee. Bidder's name and license number must be placed on the sealed envelope containing these documents.

All bids must be made out on proposal form bound in the specifications. No interlineations, additions or deletions shall be made in the proposal form by bidder. The proposal form must not be detached from the specifications.

The City of Nashville, Tennessee, through its Mayor, reserves the right to reject any and/or all bids, to waive any informalities in the bids received and to accept any bid, which, in its opinion, may be for the best interest of the City.

E. B. SMITH, Purchasing Agent
The City of Nashville, Tennessee.

Bids: April 22, 1954

Contract No. 206 Grading and Drainage

MAINE TURNPIKE AUTHORITY
MAINE TURNPIKE

Sealed Proposals will be received by the Maine Turnpike Authority for:

Section 2—Portland to Augusta
AUGUSTA EXTENSION

at the offices of the Authority, 17 Bishop Street, Portland, Maine until 10:00 A. M., Eastern Standard Time on April 22, 1954 at which time and place the Proposals will be publicly opened and read.

The work included under this Contract extends from just south of the Royal River in the Town of New Gloucester near Mile 69 to the Androscoggin River in the City of Auburn near Mile 76.

The principal items of work will include:

Clearing, Acres	125
Excavation—Earth, Cubic Yards	1,650,000
Excavation—Rock, Cubic Yards	81,000
Borrow, Cubic Yards	567,000
Pipe, Linear Feet	23,926
Inlets, Each	77
Concrete, Cubic Yards	131

Plans and contract documents may be examined by prospective bidders during regular office hours at the offices of the Authority at the above address and at the offices of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y., and may be obtained from the Authority, 17 Bishop Street, Portland, Maine, upon payment of Thirty-Five Dollars ($35.00) for each set which will not be refunded. Bound sets of cross-sections will be furnished for an additional payment of Fifty Dollars ($50.00) per set, not returnable. Checks shall be made payable to Howard, Needles, Tammen & Bergendoff. Upon application to the Portland office of the Consulting Engineers (15 Bishop Street, Portland, Maine), partial sets of cross-sections will be furnished at Fifty Cents ($0.50) per sheet.

Proposals must be accompanied by a certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than five per cent (5%) of the Total Amount in the Proposal but not less than $500.00 nor more than $200,000.00.

Proposals must be made upon the Proposal forms furnished separately by the Authority with the contract documents and must be enclosed in the sealed special addressed envelopes provided therefor bearing the name and address of the bidder and the number of the Contract on the outside.

Before the award of the Contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work within the time required and to the satisfaction of the Authority.

The Bidder, to whom a Contract is awarded, will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

The Authority reserves the unqualified right to reject all Proposals or to accept that Proposal which in its sole judgment will under all circumstances—serve its best interests. The Contract will be awarded or Proposals rejected within thirty days after the date of opening Proposals, except that in the event of default by a successful bidder the Authority reserves the right to accept the Proposal of any other bidder within twenty days after such default.

MAINE TURNPIKE AUTHORITY
Paul C. Thurston, Chairman
Portland, Maine
April 5, 1954

Official Proposals Columns

of

ENGINEERING NEWS-RECORD

are MUST reading, each week, for contractors, engineering-construction companies, equipment and materials manufacturers, all over the United States.

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Official Proposal Division

ENGINEERING NEWS RECORD

Address: New York 36, N. Y.

OFFICIAL PROPOSALS

Bids: April 27, 1954

Route 42, Section 12-A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE 42, SECTION 12-A, NORTH-SOUTH FREEWAY, and NEW DELAWARE RIVER BRIDGE APPROACHES & CONNECTIONS

Route 42, Section 12-A, North-South Freeway and New Delaware River Bridge Approaches and Connections, Grading, Bridges and Incidental Paving, City of Gloucester, City of Camden, and Haddon Township, Camden County. Federal Project No. U-193(1). Length of Project 1.832 miles. The principal items of work are:

Estimated:

GROUP "A"
Roadway Items Common to both Alternatives 1 & 2

4,555 cu. yds. Roadway Excavation—Earth
216,150 cu. yds. Wet Excavation
11,760 cu. yds. Overload Removal
2,177,420 cu. yds. Borrow Excavation
853,240 lin. ft. Vertical Sand Drains
125,000 cu. yds. Channel Excavation
15,022 sq. yds. Macadam Base Course, 7" thick
15,022 sq. yds. Pavement Type MA-BC-2, 3" thick
3,212 lin. ft. Corrugated Metal Culvert Pipe, various sizes
3,095 lin. ft. 10" Cast Iron Pipe, Class 150
7,406 lin. ft. White Concrete Vertical Curb
13,450 cu. ft. Concrete Cribbing
Lump Sum—Electrical Work

GROUP "B"
Roadway Items—Alternative 1 (Sand Drain Method)

1,028,520 cu. yds. Borrow Excavation
489,370 lin. ft. Vertical Sand Drains
12,640 cu. yds. Overload Removal

GROUP "C"
Roadway Items—Alternative 2 (Wet Excavation & Backfill Method)

1,128,490 cu. yds. Wet Excavation
1,613,240 cu. yds. Borrow Excavation

GROUP "D"
Bridge Items Common to both Alternatives 1 & 2

6,781 lin. ft. Cast-in-Place Concrete Piles
864 lin. ft. Precast Concrete Piles
6,917 lin. ft. Treated Timber Piles
46,359 lin. ft. Untreated Timber Piles
7,320 cu. yds. Concrete in Structures
937,000 lbs. Reinforcement Steel in Structures
1,877,000 lbs. Structural Steel
2,000 lin. ft. Metal Railing

(NOTE: Bidders may submit bids on either Alternative 1 including Group A, Group B and Group D (Sand Drain Method) or Alternative 2 including Group A, Group C and Group D (Wet Excavation and Backfill Method)

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 27, 1954, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the Prequalification Law (R.S.52:35) and the regulations adopted by the Acting State Highway Commissioner. In this connection the attention of bidders is directed to the following excerpt from the revised regulations, which became effective March 27, 1954:

"Class "Z" (Unlimited) involves work in excess of $6,000,000.00. A prospective bidder, so prequalified, will be notified of the intention of the New Jersey State Highway Department to undertake a project in the "Unlimited" class, and such prospective bidder shall be required to specifically prequalify to bid upon the work in question by applying for such specific classification at least twenty (20) days before the date set for the receiving of bids."

Prospective bidders are notified that this project is in the "Class 'Z' (Unlimited)" Class.

Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P. L. 413, 82nd Congress, and by an agreement between the State and the Delaware River Port Authority, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 910 Broadway, Camden, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all unskilled labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished upon the payment of a fee of Twenty-five Dollars ($25.00) which will not be refunded for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: April 28, 1954

State Project No. 283-09-01

NOTICE TO CONTRACTORS: Sealed proposals will be received by the Louisiana Department of Highways, Baton Rouge, Louisiana until 11:00 A.M. on Wednesday, April 28, 1954, and publicly opened and read for the construction of State Project No. 283-09-01, Federal Aid Project No. U-409(3), Harvey Canal Tunnel, State Route No. 2200, Jefferson Parish, Louisiana. Plans and specifications may be examined and information obtained from Palmer and Baker, Inc., P.O. Box 346, Mobile, Alabama. Plans and specifications may also be examined at the Louisiana Department of Highways, Baton Rouge, Louisiana. Complete copies of same will be furnished bona fide bidders at Louisiana Department of Highways upon deposit of $100.00 per set with the privilege of obtaining up to three (3) sets of plans and specifications upon a deposit of $100.00 for each set. The total deposit, if a bid has been made, will be remitted if all papers are returned in good condition not later than thirty days after the opening of bids. All sets must be returned within thirty days.

LOUISIANA DEPARTMENT OF HIGHWAYS
GEORGE S. COVERT, DIRECTOR

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4153), will be received at Denver, Colorado, until 2 p.m., May 13, 1954, for furnishing one (1) 230-kv (900-kv BIL), 1,200-ampere, 5,000,000-kva power circuit breaker for Watertown Substation, Transmission Division, South Dakota. Missouri River Basin Project. Delivery is desired within 420 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

GENERAL SUPERINTENDENT or Project Manager. A minimum of 15 to 20 years experience in the operation and maintenance of heavy cranes and draglines required. Knowledge of all other heavy construction equipment desirable. Experience should also include responsibility for costs and the ability to deal and associate with industrial executives. Work involves the directing of operations on the site of a steel mill located near Calcutta, India. Address all replies to Box P-2187, Engineering News-Record giving complete personal information: All details of work experience; at least 5 references as to character and ability and the terms of employment and salary arrangements required. P-2187, Engineering News-Record.

GRAVEL PLANT Superintendent for portable and stationary plant in Michigan and Indiana. State exact experience and wages. P-1810, Engineering News-Record.

ELECTRICAL ENGINEER, graduate preferred. Must have practical experience in the overall electrical installations of sewage disposal plants, filter plants, power plants, industrial buildings, multipal housing, hospitals, schools etc. Must be experienced in bidding and purchasing, and able to assume the overall management of this department. Employment will be with Mid-west firm on a salary and profit sharing plan. All replies will be held confidential. Send resume of experience, education, personal details and reference with the first letter. Address P-2330, Engineering News-Record, 520 N. Michigan Ave., Chicago, Ill.

SUPERINTENDENT—COMPLETE knowledge of road construction and bituminous paving. Must be able to estimate and take charge of complete road job. Year around position with reliable construction company in Central New York. P-2292, Engineering News-Record.

WANTED: COST accountant engineer highway construction office Eastern N. Y. Experienced man only. Send resume. P-2264, Engineering News-Record.

MECHANICAL ENGINEER, graduate preferred. Must have practical experience in installing piping, equipment, plumbing and heating in sewage disposals, filter plants, power plants, industrial buildings, multipal housing, hospitals, schools etc. Must be experienced in bidding and purchasing, and able to assume the overall management of this department. Employment will be with Mid-west firm on salary and profit sharing plan. All replies will be held confidential. Send resume of experience, education, personal details and reference with the first letter. Address P-2329, Engineering News-Record, 520 N. Michigan Ave., Chicago, Illinois.

SEWER CONSTRUCTION Foreman for disposal plant—concrete & sewer line work. Small but aggressive firm has excellent opening for man who is not afraid to handle a pick & shovel, yet has ability to plan and run a job. Right man could get percent, interest, or bonus. Now in New Jersey. Reply P-2334, Engineering News-Record.

CONSULTING ENGINEERING firm in deep south now entering industrial design and construction field requires engineer with design and organization ability. Experience required in natural gas, petroleum, petro-chemical and allied fields, or for manufacturing plants. Outline experience briefly. P-2138, Engineering News-Record.

CIVIL ENGINEER, graduate preferred, for county and township road and bridge survey design and construction, position permanent, opportunity for advancement. State schooling, experience and salary expected. P. O. Box 23, Carthage, Illinois.

ESTIMATOR-ENGINEER — Smaller growing General Contractor operating in Cleveland and Northern Ohio Area wants young experienced estimator with experience in Public Works and Eng. type structures. Please send resume and salary desired in first letter. P-2311, Engineering News-Record.

(Continued on page 104)

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The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

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Send NEW ADVERTISEMENTS: To New York Office, 330 W. 42nd St., N. Y. 36 for April 22nd issue closing April 12th

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BRIDGE ENGINEERS
AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

Construction Machinery Distributor
WANTS
EXPERIENCED PARTS MAN
to Work in New Jersey

SW-2317, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

CHIEF DRAFTSMAN

To assume complete responsibility of Drafting Room for Southwestern steel fabricator, supervising 20 to 30 workmen. In reply give full education, experience, background, age and salary expected.

P-2244, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

ENGINEER—CIVIL to take off quantities, assist in pricing, and do layout work in the field by Highway and Utility contractor in the Western New York area. Permanent position for right man. Salary and percentage.

P-2300, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

BRIDGE ENGINEERS

experienced in design of highway bridges. Excellent opportunity for responsible men. Please write giving complete qualifications.

Berger Associates
404 South Clinton Street
Syracuse 2, New York

CHIEF ENGINEER
for Middle Essex County, N. J.

must be thoroughly familiar with site planning, storm and sewer design. Permanent organization.

Salary $10,000 for well qualified man

P-2379, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

(Continued from preceding page)

CIVIL ENGINEERING Graduate, under 40 years, paving experience desirable, for technical, promotional, educational work in Pennsylvania. Permanent. Please give summary of education, experience, salary requirements in reply. P-2320, Engineering News-Record.

SALES ENGINEER—We need experienced concrete or concrete construction engineer. Must have sales ability and potential to organize and head branch office. Salary, expenses and commission. Various locations. Considerable traveling. Interesting, long term, independent position. Sika Chemical Corporation, Passaic, New Jersey.

STRUCTURAL DETAILERS: 2 years minimum experience. Pleasant working conditions with old established firm. Write giving resume of experience and education and state salary expected. Richmond Steel Company, Inc, P. O. Box 1578, Richmond 13, Virginia.

POSITION AVAILABLE—Male opening for assistant managing director for contractors trade association upstate New York. Write—age and full data of experience and references. P-2351, Engineering News-Record.

ESTIMATOR: General Contractor in Lehigh Valley, Pennsylvania. Must have take-off experience on all types of industrial and commercial buildings. Reply giving name, address, age, education, experience and salary desired. P-2352, Engineering News-Record.

WANTED—YOUNG graduate Civil Engineer. Willing to start from the bottom with established road contracting firm. P-2367, Engineering News-Record.

STRUCTURAL CHECKER—We need thoroughly experienced checker of structural steel erection plans, shop detail drawings, etc. Top rate to qualified applicant. Permanent job in New Orleans, La., established fabricating company. Answer fully, giving age, marital status, experience, references who know your work. P-2387, Engineering News-Record.

FIELD ENGINEER C.E. Experienced structural steel bridges North Eastern states. Give full particulars salary desired. P-2410, Engineering News-Record.

RESIDENT ENGINEER for rock tunnel construction. Must have experience in supervision of same for owner or contractor. Location southern New England. Submit experience, salary required and references. P-2400, Engineering News-Record.

PLANT SUPERINTENDENT wanted for old established structural precast concrete Plant. Preferably with Engineering background. Please submit complete resume stating experience, salary required and date available to P-2395, Engineering News-Record.

WANTED—GRADUATE Civil Engineer to work for Class 1 Railroad in the Northeast. Applicant must be able to engage in all field and office work common to railroad maintenance, and must be able to competently handle structural analysis of bridges and buildings, prepare plans, and estimates, and do necessary field work in connection with bridge, building, and track maintenance and construction. Salary $3,936.00 per annum, or more, depending upon experience and qualifications, plus cost of living adjustment. Position has liberal pension, vacation and sickness benefits. Give complete details of education, experience and qualifications with application. P-2425, Engineering News-Record.

OPENING WITH an old, reliable construction company in Baltimore, Md. for general construction estimator. Excellent future. Desirable surroundings. Submit references with detailed statement of past experience. Reply: P-2416, Engineering News-Record, 330 W. 42nd Street, New York 36, N. Y.

SELLING OPPORTUNITY OFFERED

WELL ESTABLISHED construction firm desires representative with a knowledge of the construction industry and preferably a compand of the Spanish language and customs to represent them in foreign negotiations for work in the building, heavy construction, and Industrial fields. Will headquarter in the Southwest, but must be able to travel extensively. Five full details as to education, experience, salary expected and enclose references and recent photographs. RW-2421, Engineering News-Record.

EMPLOYMENT SERVICES

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1, Cove-McKane Int., GPO Box 126E, NY 1, NY.

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

CIVIL ENGINEER, Age 33, desires employment in a permanent location, 11 yrs. experience including sewer & water line construction, office engineering, highway office work, inspection work, some building construction, surveying & drafting, and cost engineering, 5 yrs. on construction of Atomic plants. Minimum salary requirements $6000. Geographic location immaterial. Available April 15. Will acknowledge all replys to this ad. PW-2246, Engineering News-Record.

BRIDGE CARPENTER Foreman 12 years experience in all phases of Bridge Construction desires position in Southern N. Y. State or Penna. PW-2290, Engineering News-Record.

SUPERINTENDENT CONSTRUCTION — Concrete highways. Bridges, Industrial Buildings. Twenty years experience. PW-2303, Engineering News-Record.

CONSTRUCTION ENGINEER — C.S. graduate 25 years experience general and industrial chemiffcal construction covering new contracts, office project management and field superintendence. Seek connection where top man required. PW-2333, Engineering News-Record.

PROJECT MANAGER or General Superintendent over 25 years of diversified experience on heavy Construction desires connection with construction company doing domestic or foreign work. Highest reference. PW-2247, Engineering News-Record.

CONSTRUCTION EXECUTIVE long New York experience, qualified to handle all phases of contracting, bid to completion, buildings and heavy construction, field or office, open for new connection, preferably in New York area. C. O. Sutherland, 18 Edgemere Blvd., Shrewsbury, Mass. Tel. Worcester 7-3506.

CONSTRUCTION SUPERINTENDENT and Engineer desires work in New England. Experienced industrial plants, housing, heavy construction, bridge and marine work, skilled estimator. PW-2228, Engineering News-Record.

(Continued on the opposite page)

STRUCTURAL STEEL FABRICATOR

● Can you use representation in Metropolitan New York by a man with a thorough knowledge and experience of the business. If desired estimating, detailing and erection can be arranged for.

RA-2124, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED
(Continued from opposite page)

CONSTRUCTION ENGINEER:—15 years experience heavy construction, Power plants, refineries, industrials, 2 years Middle East, now completing design contract in Caribbean, some Spanish, Arabic, would like permanent connection. PW-2397, Engineering News-Record.

DRAFTSMAN WANTED—Experienced for detailing miscellaneous and/or structural steel by Bushnell Steel Company, P. O. Box 2579, Jacksonville, Florida. Reply giving brief resume of experience, education, availability, and salary expected. PW-2386, Engineering News-Record.

DISTRICT REPRESENTATIVE — Contractors equipment. Power shovel background. Age 36, aggressive, reliable, accustomed responsibility. 15 years various phases engineering and sales. 13 years one company. PW-2363, Engineering News-Record.

MECHANICAL SUPT., Mechanical inspector or master mechanic. Twenty-five years' experience with Erection, Repair, Maintenance of heavy industrial equipment in Power Plants, Pumping Stations, Industrial Buildings. Supervising Installation, Testing Air Conditioning, Freon Refrigeration, Steam Boilers, Steam Distribution, P.O.L. Systems, Heating, Plumbing, Diesel Engine Driven Generators. Available now. PW-2375, Engineering News-Record.

CIVIL ENGINEER, BSCE, single, 28, experience in railroad engineering department. Desires position in Southern California. Box PW-2371, Engineering News-Record, 520 N. Michigan Ave., Chicago 11, Ill.

CONSTRUCTION SUPT., Project mgr. 25 yrs. experience in Bldg. construction all types. Presently employed N. Y. C. Seeks permanent connection Eastern area. Minimum salary $10,000 year. Highest references. PW-2412, Engineering News-Record.

CONSTRUCTION MANAGER, presently employed by leading industrial firm. Must relocate in South, Southwest, or favorable foreign climate. Experience includes administrative, organization, field supervision and engineering of industrial, commercial and public building and heavy construction. My capabilities include client contact, purchasing, negotiation of contracts, estimating, engineering, organizing and directing administrative and field forces. I participated in the original development and application of methods engineering in the construction field. Proven record for hard hitting economical construction management will be submitted on request to PW-2424, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

ESTIMATOR & CONSTRUCTION Engineer — thoroughly familiar with all phases of take-offs, pricing, sub bids, for commercial and industrial buildings, sewage treatment plants, refineries. PW-2418, Engineering News-Record.

DRAFTSMAN—Good freehand letterer.—PW-2362, Engineering News-Record.

REGISTERED STRUCTURAL Engineer, architectural background, 12 years design experience for all types of structures including 2 years overseas air base design. Desires responsible position. Single, free to travel. PW-2348, Engineering News-Record.

INDUSTRIAL ENGINEER 36, graduate, 15 yrs. exp. design & estimating in conn. with construction of chemical & industrial plants. Presently employed as asst. chief engineer. Seeks responsible relocation. Prefer South or S. West. PW-2427, Engineering News-Record.

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Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:

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ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty third year
Write today for facts, without obligation.
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Structural and Plate Steel Fabricators

Open capacity for quick delivery now available. We solicit your inquiries for Steel Fabrication and Warehouse Steel Products. Let us figure your jobs . . . Large or Small.

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GIANTS UNDER THE EARTH
The Construction of the Brooklyn-Battery Tunnel
This is the story of the key men of the miraculous 20th century—those hardy human sandhogs who dug under water and blasted through earth and rock to build the slick, modern tunnels we use today for fast motor and railroad traffic.
Illustrated and photos. Per copy.....$1.50
Send check or money order to
PATRICK J. COSTELLO
152 E. 46th St. New York 17, N. Y.

WANTED
Steel Warehouse Building
To be dismantled, from 15,000 to 40,000 sq. ft., with overhead Crane 65'0" or longer span.
HILLSDALE BLDG. MAT. CO., Inc.
2200 Kienlen Ave. St. Louis 20, Mo.

WANTED TO BUY
McKIERNAN-TERRY 9B3 or 10B3
PILE HAMMER
60 h.p. oil fired vertical boiler, generating 125 lb pressure—all must be in A-1 condition
HALLORAN CONSTRUCTION CO.
1 Washington Ave. Providence, R. I.

WANTED TO RENT
2—4 cu. yd. DRAGLINE
At least 80' boom. Eastern New York Location.
W-2401, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR SALE
AUSTIN TRENCHING MACHINE
Digs up to 40" wide and 20' deep. Powered with Twin City engine. Good condition. Extra Parts. Price $5,800
TORSON CONSTRUCTION CO.
1890 Woodswether Rd., Kansas City, Mo.

FOR SALE
BUCYRUS-ERIE 44-B CRANE-DRAGLINE
Buda Diesel power, oversize mounting, presently operating at Warren, Ohio.
Bass Eng. & Const. Co., Birmingham, Mich.

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This index is published as a convenience to the reader. Every care is taken to make it accurate but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

Albert Pipe Supply Co., Inc. 106
Allied Construction Equipment Co. ... 105
Ambursen Dam Co., Inc. 108
American Air Compressor Corp. 107
Amerlux Steel Products Corp. 108
Anderson Equipment Co. 105

Bahr, Edward E. 105
Bass Engineering & Construction Co. 105
Berger Associates 104
Boers Equipment Co., Gil. 107

Carlyle Rubber Co., Inc. 106
Clemens Construction Co. 106
Concrete Equipment Co. 108
Contractors Machinery Co. 107, 108
Costello, Patrick J. 105

Davidson Pipe Co., Inc. 108
Deatherage & Son, George E. 105
Drachman Steel Co., Inc., Hy. 106
Dyer Co., Inc., W. H. 108

Ferber Co., L. B. 105
Flex Bituminous Co. 105
Foster Co., L. B. 108
Frank, M. K. 108
Frazier-Davis Construction Corp. .106, 107
Fruehauf Trailer Co. 108

Gillis & Co. 108
Glazer-Steel Corp. 105
Globe Pipe & Fitting Co. 106

Halloran Construction Co. 105
Hillsdale Building Materials Co., Inc. 105
Howard, Needles, Tammen & Bergendoff 104

Judge & Co., Inc., Frank M. 106

Kliebenstein Co., E. H. 108
Koch Crane and Derrick Co., Inc. 107

Lestan Corp. 105

Midwest Steel Corp. 108
Mississippi Valley Equipment Co. 108

O'Neill, A. J. 107

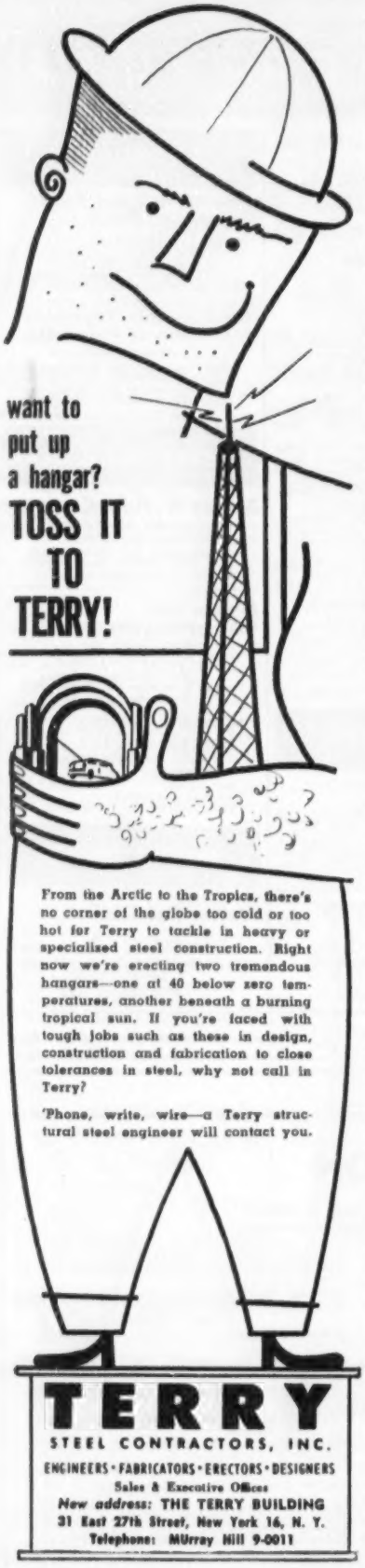
Rapid City, So. Dakota 105

Stanhope Inc., R. C. 108

Tagco, Inc. 106
Tamblyn System 105
Torson Construction Co. 105
Tractor & Equipment Co. 107

United Crane & Shovel Service Co. .. 105

Williams Construction Co. 108
Wilson Engineering Co. 105
Wing & Son Corp., R. B. 107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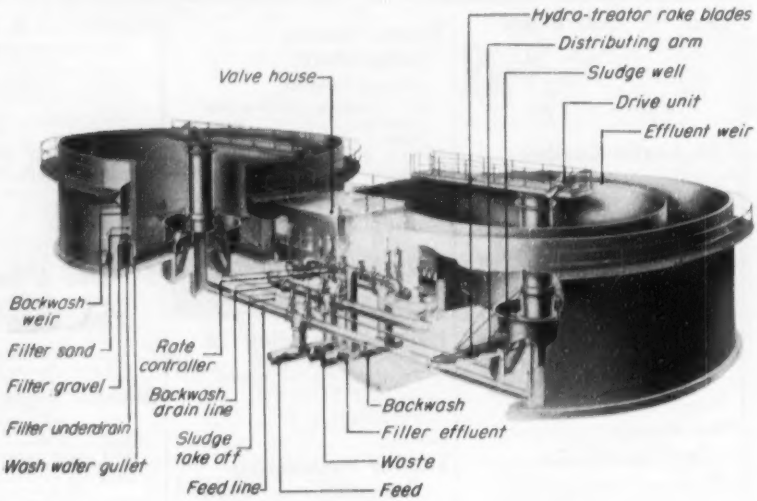

Water treatment system is packaged

New water purification unit combines pre-treatment and rapid sand filtration in a single, compact installation

The Dorr Co. announces the availability of the packaged water purification system invented and developed by E. H. Aldrich, chief engineer for the American Water Works Service Co. As reported in ENGINEERING NEWS-RECORD (Jan. 1, 1953, p. 33) this system incorporates chemical mixing, coagulating, settling and filtration in one circular steel unit.

Now trademarked the Dorrco Aldrich Perifilter System, the commercial installation is composed of a Dorr pre-treatment mechanism and an annular sand filter, both contained in a single welded steel tank.

In operation, raw water is fed directly to the pre-treatment unit, with coagulating chemicals added by means of a head box or introduced into the sludge blanket. Settled solids in the pre-treatment compartment are raked by positive means to the central cone and discharged, while clarified water overflows the weir to the filter. Compartments have identical water levels, thus permitting a gentle transfer across a submerged weir and minimizing floc disintegration.

Residual turbidity and bacteria are then removed by the rapid sand filter; the filtered effluent flows to a discharge pipe and is pumped to storage. Length of filter runs is reported comparable with those obtained with ordinary filters.

Backwashing differs from that of the usual filters only in that the feed to the pre-treatment unit also is cut off in order to drain the filter prior to backwashing. The rest of the operation is the same: the filter effluent valve is closed, the drain valve opened, the wash water admitted as required and then the sequence is reversed until the entire unit again is placed in normal operation.

The manufacturer claims that initial installed costs may be reduced as much as 40% compared with customary plants, and operating costs normally will be lower because of decreased head losses through the plant and on account of the simplified operation. Further cost data has been reported in ENR, Oct. 8, 1953, p.178.

Moreover, it is said that the depth of water above the sand during operation eliminates air binding in the filter and centralized control may be provided by panel-housed instrumentation.

The Dorrco Aldrich Perifilter System is available as a complete assembly that can be designed into any water purification plant. Each individual unit includes pre-treatment mechanism, filter bottom and sand, steel tanks and walkways, hydraulic valves, rate controllers, instruments and panel boards.

Single standard units now are available in a wide range of sizes for capacities of 0.1 to 5.0 mgd. Where adequate treated water storage is available, a single unit will suffice; how-

ever the installation of at least two treatment units normally is recommended to provide an uninterrupted flow of treated water during the backwashing operation of one of the units. THE DORR CO., BARRY PLACE, STAMFORD, CONN.

New interlocking hardware cuts forming time, costs

According to the manufacturer, a newly developed line of simplified interlocking hardware will permit contractors to save from one-third to one-half on concrete form costs.

Except for the line-up brackets, all the hardware is mounted directly to 2x8-ft or 4x8-ft forms, and therefore there is no loose hardware. Further, it is said that no wales are necessary since the steel bands mounted to the forms serve this purpose.

Both inner and outer forms are set up simultaneously and lined up as each form section is locked in place. The locks draw the forms together and ridges in the finished wall are reported

(*Continued on page 114*)

FORMS are lined up, then . . .

EASILY LOCKED into place.

ESCO box points put more

DIG

IN TRACTOR SHOVELS

— says E. A. LaChapel'e, Excavating Contractor, Vancouver, Washington

Digging efficiency goes up— Bucket lip wear is cut

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minimized. Stripping time is also decreased because the forms are quickly unlocked.

According to the manufacturer, trained crews can form a complete house foundation in less than 24 man-hours, but the schedule set up by most contractors for a three-man operation is timed as follows:

8:00 am—Men start stripping forms from foundation poured the previous day.

9:00 am—One man starts setting up forms for new foundation.

11:00 am—All forms are set up and locked in place.

2:00 pm—Forms are squared, window forms in place.

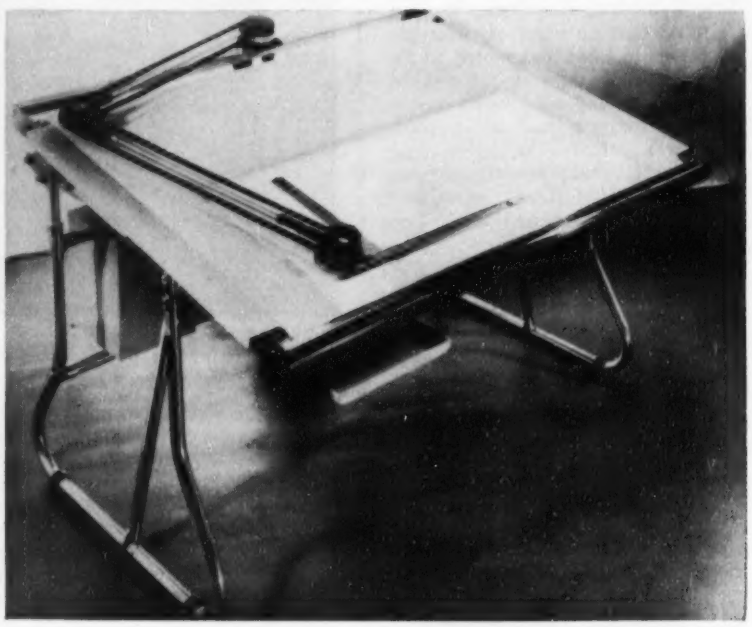
4:30 pm—Foundation and footing poured.

It is said that workmen quickly attain individual speeds of a foot a minute for setting both inner and outer forms. Furthermore, the manufacturer is organized to demonstrate the method and train men in high-speed procedure. SIMPLEX FORMS SYSTEM, 5514 NORTH SECOND ST., LOVES PARK, ILL.

New Products briefs . . .

• **Trencher**—Increased bucket capacity with widths up to 16 in. is now available on the Model 88 pneumatic-tired trenchmobile manufactured by Parsons Co., Newton, Iowa. The firm, a subsidiary of Koehring Co., Milwaukee, now offers a Model 88 with a

(Continued on page 116)



Large drawings put on conveyor belt

A new drawing board has been designed with a wide belt of flexible plastic attached to rollers on the top and bottom edges. Turning the bottom roller brings a drawing taped to the belt closer to the front of the board so the draftsman can continue to work in a comfortable and efficient posture. The device provides about twice as much usable drafting area as the ordinary drawing table of equivalent dimensions.

The belt is made of a resilient plastic called Krene that tends to return to its original shape as soon as the pressure from drawing instruments is relieved. It is reported that the plastic's qualities are particularly noticeable in using a compass point. Back up sheets are unnecessary. Drafting tape is found to adhere well to the surface but can be removed easily for reuse.

The 36x60-in. drafting board is adjustable for height and slope and adaptable for drafting machine, parallel line attachment or T-square. A reference table, two large drawers for instruments and file folders, two book shelves and a large shelf for rolled or flat drawings are built into the rear of the new unit.

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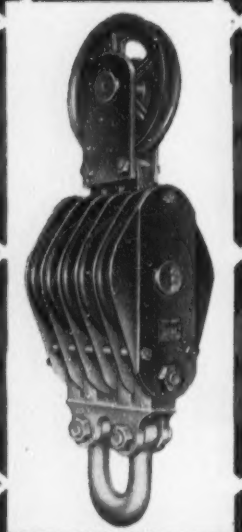

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choice of three bucket widths: 8, 12 and 16 in. Other improvements announced by Parsons include an hydraulic boom hoist with positive down crowd and three-point suspension of the wheels from the Trenchmobile frame.

• **Jet water systems**—A line of new shallow well jet water systems is now available from the Dayton Pump & Mfg. Co., 500 N. Webster St., Dayton 1, Ohio. They will be known as Rapidayton Shallow Well Champions and will be available in five different complete package systems, three "pump only" models and ten vertical tank systems.

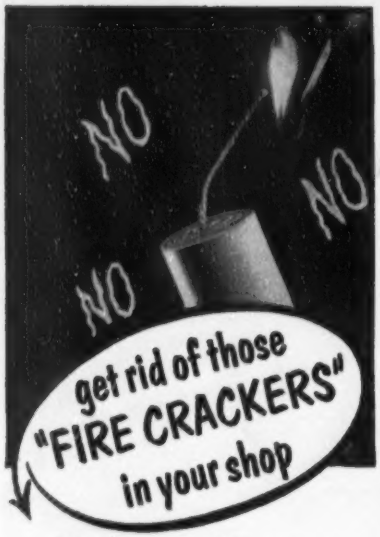
• **Duct silencer**—A new product called the Aircoustat is used to quiet fan and air noise in air conditioning systems. According to the manufacturer, Industrial Sound Control, Inc., 45 Granby St., Hartford, Conn., one standard 7-ft unit reduces noise level below that achieved by 100 ft of standard commercial duct lining. In addition, the device permits silencing of low frequency noise previously impossible to control. Pressure drop is said to be less than when the entire duct is lined.

• **Sentry-lite**—A new Model 200X Sentry-lite manufactured by Hobby & Brown Electronic Corp., 55 Front St., Rockville Centre, N. Y., provides 10,000 candle-power or more of emergency light if the regular source should be interrupted. The unit has an 18-gage steel case containing a special 100-amp storage battery that operates for more than 12 hr of continuous service. An automatic recharger always keeps the battery up to peak capacity. The unit is topped by two 5,000-candlepower sealed beam lamps fully adjustable. They can be remotely located if desired.

• **Snow blowers**—Two makes of snow blowers are now available for front mounting on tractor shovels manufactured by the Frank G. Hough Co., Seventh St., Libertyville, Ill. They are available for Model HF (¾ cu yd) and larger Payloaders. Both are of the self-powered type designed for front mounting on the Payloader boom arm in place of the bucket.

Rock rake aids in pavement removal

A new line of root and rock rakes has been designed to be interchangeable with standard makes of bulldozers. Bulldozer fittings are used for attachment. Teeth are manganese carbon steel castings and are heat treated for maximum wear. The design of the curved teeth of the root rake is said to permit them to get under brush, roots, rocks and trees and yet allow soil to be shaken through. The rock rake is strengthened to withstand severe shocks and heavy loads. While designed for heavy land clearing, both root and rock rakes reportedly can be used profitably in lighter construction. The rock rake in particular is useful in moving and windrowing broken pavement. Fleco Corp., P. O. Box 2317, Jacksonville 3, Fla.



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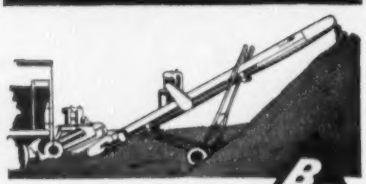

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VOL. 2

Mobile Equipment News

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IMPROVES PERFORMANCE • CUTS COSTS

NO. 4

VICKERS® VT16 PUMP NOW AVAILABLE FOR HYDRAULIC POWER STEERING OF TRUCKS AND MATERIALS HANDLING VEHICLES

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COMPLETE PACKAGE

Series VT16 has integral volume control valve and relief valve . . . also an integral oil reservoir. This is a complete hydraulic power package for steering.

SIMPLIFIED INSTALLATION

This compact and complete power package is easily and quickly installed. All you need to do is bolt it on, make two hydraulic connections, and couple the power.

LONGER PUMP LIFE

The exclusive Vickers "Hydraulic Balance" eliminates pressure-induced bearing loads and the consequent wear. These lighter bearing loads mean much longer bearing and pump life.

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ASK FOR BULLETIN M-5104A

Series VT16 Vickers Pump with integral volume control and relief valves and oil reservoir. For hydraulic power steering.

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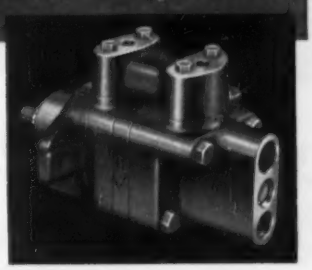

Series VT17 Vickers Pump is similar to the VT 16 except that it does not include the oil reservoir.

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American Bridge Div., U. S. Steel Corp. 37
American Pipe & Constr. Co. 75
American Surety Co. 96
Arkwright Finishing Co. 56
Automotive & Aircraft Div., American Chain & Cable Co. 81

Baker-Smith & Co. 57
Barber-Greene Co. 116
Besser Mfg. Co. 49
Bethlehem Steel Co. 1
Blaw Knox Equipment Div., Blaw Knox Co. 83
Blood Brothers Machine Co. 98
Borden Metal Products 20
Broderick & Bascom Rope Co. ..... 4th Cover
Bruning Co., Inc., Charles 8
Bucyrus-Erie Co. 3

Cement Gun Company 68
Chevrolet Motor Div., G. M. C. 46, 47
Cleaver Brooks Company 55

Deming Co., The 12
Detroit Steel Products Co. 64
Dodge Corp., F. W. 89

Electric Steel Foundry 113
Enterprise Galvanizing Co. 98

Faber-Castell Pencil Co., A. W. 54
Fairfield Engineering Co. 91
Flockhart Foundry Co. 118
Ford Motor Co. 70
Ford Motor Co., Tractor Div. 11
Fort Pitt Bridge Works 35

Gardner-Denver Company 60, 61
General Electric Company, Electronics Department ..... 2nd Cover
Getman Bros. 96
Goodrich Company, The B. F. 5
Gorman-Rupp Co. 77
Granco Steel Products Co. 40
Griffin Wellpoint Corp. 89
Gunite Concrete & Construction Co. 97

Haven-Busch Co. 74
Hendrick Mfg. Co. 74
Hetherington & Berner, Inc. 76
Hose-McCann Telephone Co., Inc. 68
Huber Mfg. Co. 67

Ideco Div., Dresser Stacey Co. 51
Imperial Pencil Tracing Cloth 91
Ingersoll Rand Co. 14, 15
Intrusion-Prepakt Co. 88

Jaeger Machine Co. 50
Joy Mfg. Co. 66

Keasbey & Mattison Co. 85
Kiewit & Sons, Peter 96
Kinnear Mfg. Co. 94

LeRoi Company 9
LeTourneau-Westinghouse Co. 78, 79
Lexsuco, Inc. 18
Lincoln Electric Corp. 48
Lipe-Rollway Corp. 10

Mack Trucks, Inc. 6, 7
Manitowoc Engineering Works 73
Masonite Corp. 59
Maxon Construction Co. 82
McKiernan-Terry Corp. 86
McKinney Drilling Co. 94
McKissick Products Corp. 114
Moretrench Corp. 119

National Surety Corp. 80
Naylor Pipe Co. 62

Ohio Locomotive Crane Co. 98
Oliver Corp. 16

Patent Scaffolding Co. 80
Permutit Co., The 63
Plasteel Products Co. 32

Raymond Concrete Pile Co. ..... 3rd Cover
Robertson Co., H. H. 44, 45

St. Paul & Tacoma Lumber Co. 42
Salem Tool Co. 4
Sauerman Bros., Inc. 71
Schramm, Inc. 69
Servicised Products Corp. 84
Sika Chemical Corp. 66
Smith Welding Equipment Corp. 116
Sprague & Henwood, Inc. 97
Standard Oil of Indiana 58
Standard Steel Spring Div., Rockwell Spring & Axle Co. 38
Stang Corp., John W. 13
Stoody Company 115
Stow Mfg. Co. 84

Taller & Cooper, Inc. 52
Terry Steel Contractors, Inc. 112
Trailer Village, Inc. 90
Truscon Steel Company 43
Twin Disc Clutch Co. 95

Union Mercantile Co. 90
U. S. Rubber Co. 53
United Steel Fabricators, Inc. 97

Vibroflotation Foundation Co. 94
Vickers, Inc. 117

Walker Process Equip. Co. 90
Waukesha Motor Co. 65
White Motor Co. 87
Wild Surveying Instrument Supply Co. of Amer., Inc., Henry 2

Professional Services 109-111

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

Employment 103, 104, 105
Educational 105
Notices
Proposal 99-103
Equipment
(For Rent, Sales, Wanted) .. 105-108

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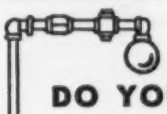

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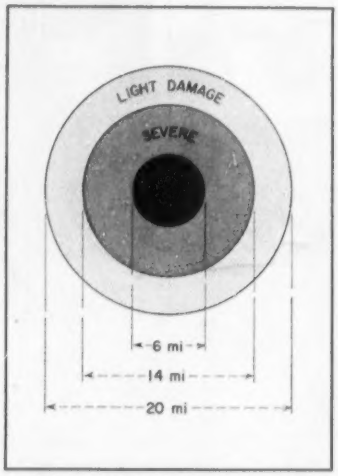
The H-Bomb: Defense isn't futile—but more important

THE HYDROGEN BOMB that blasted out a saucer-shaped crater one mile wide and 175 ft deep, and the even more powerful bomb tested last month, compel a re-examination of civil-defense planning. Not that the fundamentals have changed, but the magnitude of the task has grown with bomb size. The problem still is one for construction men—to maintain communications and services despite an attack and to design structures and shelters so that they will be safe in the fringe areas of a blast. That was the problem with block-busters, it was the problem with A-bombs and it remains the problem with H-bombs.



DAMAGE ZONES about "ground zero" of H-bomb tested in 1952.

What the H-bombs have changed, within the scope of civil defense, is the size of the fringe area, and the zone in which ordinary construction will suffer some structural damage but will not be completely demolished. Much can be done at reasonable cost to protect people and reinforce structures in such areas. We should begin at once the necessary measures.

THE NAGASAKI AND HIROSHIMA A-BOMBS, estimated to have been equivalent to 20,000 tons of TNT, caused virtually complete destruction over an area 1 mile in diameter, major structural damage over a 2-mi-dia and partial damage over a 4-mi-dia. The H-bomb exploded in November, 1952, increased these diameters to 6, 14 and 20 mi. Assuming that the radius of destruction varies with the cube root of the energy released, the bomb was equivalent to at least 4 megatons (4 million tons) of TNT. If this energy is increased 400%, to 16 megatons, as it may well have been for the bomb tested March 1 of this year, the circle of complete destruction is enlarged only 50%, to 9 miles in diameter. Somewhere in the range of this largest bomb it may be economic, from a military viewpoint, to stop, since the increases in destruction are not commensurate with the tremendous increases in energy required. And a larger bomb may be impracticable to deliver.

There is, of course, little comfort in the fact that a 9-mi-dia area—equal in size to the heart of any city in the world—can be destroyed with one bomb. Nevertheless, if we plan civil defense properly and implement the plans while we still have time, we can save people and structures beyond this circle. And since fundamental defense measures have not changed with bomb size, we have a framework about which defense activities can be easily expanded.

INCREASE IN BOMB SIZE, however, does introduce an important new consideration in the preparation of dispersal plans for defense production plants. Critical facilities, instead of being located only about 10 miles from another possible target, may now have to be placed as much as 100 miles apart. And where it has been necessary for cities to coordinate civil-defense activities only with closest suburban neighbors, it may now be necessary to call upon communities 100 or more miles away for help.

Increasing bomb size, on the other hand, has not changed the nature of the problem of providing shelters for protection of personnel during an air raid. Big shelters in scattered locations are still as inadvisable as they were for protection against blockbusters. One or more conveniently located small shelters in or near every building not only will prove more economical, but they will save more lives.

The nature of the problem of providing buildings and other structures with adequate bomb resistance also has not changed. How much money should be spent to prevent damage to structures that may lie in fringe areas of a bomb burst?

Nor does the development of bigger bombs make complete evacuation of urban areas any more practicable than before. But it does make urgent construction of additional avenues of ingress and egress for cities to facilitate what partial evacuation may be possible and to ease rescue operations. These roads have been needed for non-military reasons but have been delayed because of financing difficulties. The threat of the H-bomb makes their early construction imperative.

ACTUALLY, MANY OTHER MEASURES that should be taken to make cities more livable and efficient would aid civil defense. Moreover, arrangements for coping with accidentally damaged utilities because of fires, flood, tornadoes, earthquakes and other disasters are precisely the same as those needed to cope with bomb attacks. These steps should be taken even though there is no danger of bombing.

It would not be wise at this stage of international negotiations to assume that nuclear weapons never will be used against us. Nor does it make sense to assume that defense against the newer and bigger bombs is impossible. The H-bomb has not made defense measures futile, but has rendered them more important.

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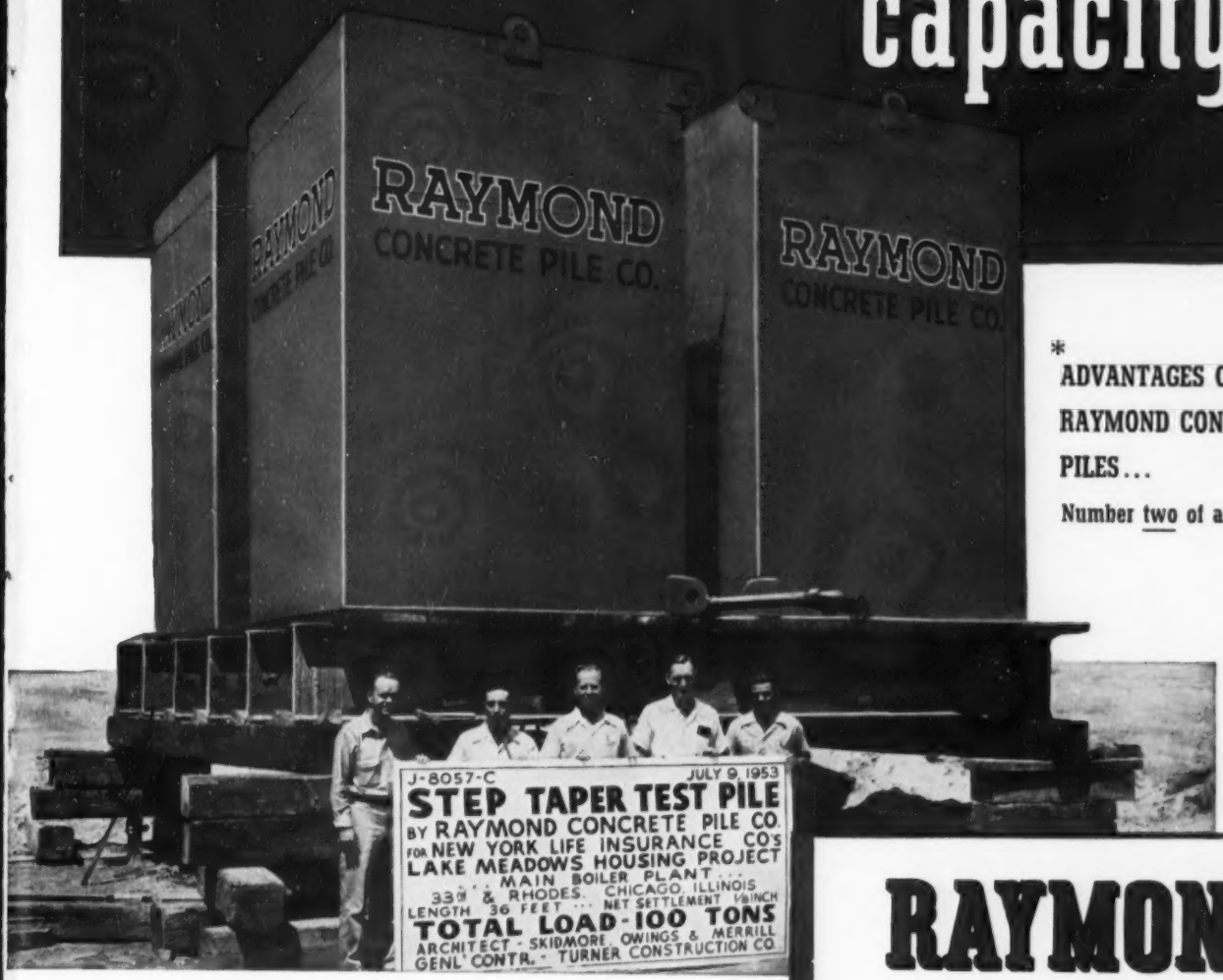

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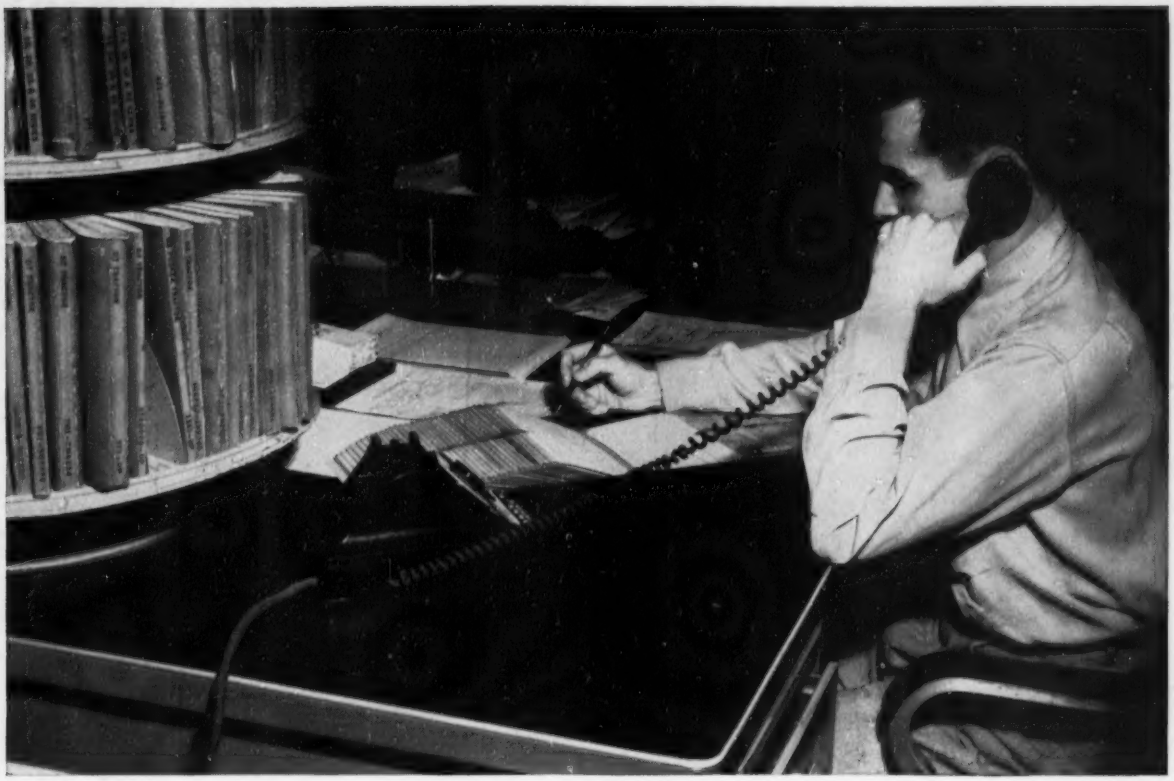

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